

REPORT

OF THE

CHIEF INSPECTOR OF FACTORIES AND WORKSHOPS

TO

HER MAJESTY'S PRINCIPAL SECRETARY OF STATE
FOR THE HOME DEPARTMENT,

FOR THE

Year 1895.

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REPORT of R. E. SPRAGUE ORAM, Esq., C.B., H.M. Chief
Inspector of Factories, for the Year 1895.

Home Office,

SIR,

January 1896.

I BEG to forward my report for the year 1895, the last which I shall have the honour of submitting prior to my retirement, after employment in the public service for nearly half a century.

During this time, I have seen the gradual rise and progress of factory legislation, and the continually growing demands made upon the Factory Department.

I need only call attention to the political features of the time and the active development of a national interest in labour questions, for a full and perfect explanation of such demands. While doing so, I may be permitted to refer to the great amount of good work which has already been done by the Factory Department.

Difficulties have been overcome—many difficulties. And in this connection, the reception by the manufacturers of the various alterations in the law has been considerably facilitated by the patient and unobtrusive efforts of the officers of the Department.

The attitude now generally exhibited towards the Inspectors of Factories by employers of labour has been earned by this quiet work and by the avoidance of undue friction. This attitude, I submit, may be fairly regarded as an important factor in the successful application of the various stringent special rules for dangerous trades, which, in virtue of increased powers, have been promulgated by the Legislature.

The many special inquiries necessitated before the introduction of any such rules, the compilation of these, and their introduction to those interested, together with the general increase of work and other important developments in connection with the Acts of 1891 and 1895, have rendered the past year or two exceptionally laborious for the Department, and I owe to my colleagues very grateful thanks for their cordial and unflagging co-operation.

In my reports for 1893 and 1894, I entered at considerable length into the details of inquiries made which resulted in the compilation of the special rules, constituting matters of practical concern and interest to employers and employed. The committees you have appointed to inquire into miscellaneous dangerous trades have not yet presented their reports, which will doubtless contain a mass of valuable information, leading to regulations which will tend to prolong the lives of those who are employed in the industries forming the subject of the inquiries.

I do not think that eventually there will arise much difficulty in compelling a fulfilment of the special rules in their various application.

Any such new departure has its attendant obstacle in the prejudices of heretofore unrestricted custom.

The additional powers conferred on the Inspectors of Factories, by the Act of 1891, in connection with the fencing of dangerous machinery, has proved most valuable. The extension of the compulsory fencing requirements to the dangerous parts of the machinery was an addition long needed.

During the past year H.M. Inspectors have been busily occupied in making inquiries connected with matters included in the Act of 1895, which has just come into force. For the various Acts to have the beneficial effect desired it is absolutely necessary that there should be thorough co-operation between the sanitary authorities and H.M. Inspectors. The local authorities have not, with some exceptions, as mentioned in former reports carried out the powers conferred by the Act of 1891, which contained most important and comprehensive provisions, transferring work previously appertaining to the Factory Department to them with the intention of relieving the Factory Inspectors to a great extent of the inspection of workshops, so far as sanitary matters are concerned. By section 26 (1891) notices of the opening of new workshops, and by section 41, (1895) of all workshops, have to be sent to the Inspector of Factories, and when he receives such notices he is required to forthwith forward them to the sanitary authority of the district in which the workshop is situated.

A very large proportion of workshops, especially in the boot and shoe trade, only employ men, and the medical officer of health is required by the Factory Act 1891, section 3, whenever he becomes aware of any child, young person, or woman being employed in a workshop forthwith to give written notice thereof to the Factory Inspector of the district. If, in the course of his visits, the Inspector of Factories observes that any of the provisions of the Public Health Acts are disregarded, he is required by section 4 (1878) to give notice in writing to the sanitary authority of the district, and such sanitary authority is to make inquiry into the complaint. The Act of 1895, section 3, makes it the duty of the sanitary authority to inform the Inspector of Factories as to the proceedings taken in consequence of the notice. If within one month (Factory Act 1895 section 3 and 1891 section 2), proceedings are not taken by the sanitary authority, the Inspectors of Factories are authorised to take proceedings and recover from the sanitary authority all expenses incurred in any successful proceedings, except such as are recovered from any other person.

It is the desire of the Factory Department to co-operate most thoroughly with the local authorities, and, with that object in view, I have requested each of H.M. Inspectors of Factories

to have a conference with the medical officers of health in their respective districts.

PROVISIONS AS TO SANITATION AND SAFETY IN THE ACT OF 1895.

The settlement of the question as to the minimum cubic feet Overcrowding. of space to be allowed to each person in a factory or workshop will be of great assistance to both the medical officers of health and H.M. Inspectors of Factories.

In my replies to the Commissioners of the Factory and Workshop Act Commission I remarked that "with reference to " overcrowding, it is very desirable that a minimum number of " cubic feet for each person should be given in the Act, say 250 " or 300, which would greatly facilitate the enforcement of the " sanitary clauses."

Indefiniteness is what I find universally objected to by manufacturers. Their desire is if they take a room or rooms they should know how many persons they can employ there.

In his report for the half-year ending April 1877, Mr. Redgraves observes:—

"After advising with several of the medical officers of health, I decided upon requiring that not less than 250 cubic feet of space should be allowed for each person employed in factories, and I communicated this decision to all the local authorities in my district, in order to secure their co-operation in dealing with workshops."

Mr. Hoare remarks:—

"I think the space required by the Act of 1895 is sufficient. I wish I could enlarge the views of occupiers on the subject of ventilation; they often do not go beyond the fact that having plenty of windows which will open is sufficient, and refuse to see that that only means placing the hands in a draught. I think there should be some allowance of space given to gas burners, as a large number are often used in the winter months in large workrooms."

Mr. D. Walmsley observes:—

"A distinct advance in the sanitation of factories and workshops will be made by the new Act of 1895, not the least important being the minimum space of 250 cubic feet for each worker. This will strengthen the hands of H.M. Inspectors, and enable them to take steps in sanitary matters, which has hitherto not been advisable, on account of over-crowding being so vaguely expressed."

Mr. Knyvett reports:—

"I desire to point out with regard to the cubic space clause, that I consider that some limit should be placed on the amount of height allowed to be taken into measurement. In Birmingham the local officials never count anything above ten feet when measuring workshops or other places under their jurisdiction; and in support of this plan, I have received the following remarks from Mr. E. S. Machin, one of the certifying surgeons of my district, who has had long and very valuable experience amongst factories and workshops. He says: 'I have met

' with several inquiries to-day whether the entire height may be counted ' in the cubic space. For instance, in the case of a foundry 20 feet in ' height, does the Act only require that each worker should have 16 feet ' (viz. 4 by 4) of superficial area ? ' And in reply to my explanation in the affirmative, he adds : ' I shall be surprised if this question does not cause trouble in the way of defeating the object of the new Act.' "

Mr. Bellhouse observes :—

" The new Act of 1895 will, I think, be of great service in many ways. I am exceedingly glad to see, in the first place, that the question of necessary cubic space in factories and workshops has at last been definitely defined. It will be of great help to all inspectors to have something definite to go on. I am exceedingly glad too, to see that the question of warming factories, and especially work-rooms, has received attention."

Major Roe observes :—

" I believe the provision in the 1895 Act of a fixed minimum of cubic space in both factories and workshops for all persons employed a good one, as it now places beyond any dispute the air space required when allotting workers to rooms or building new premises for manufacturing purposes."

Mr. Crabtree remarks :—

" *Defined Space*—I look upon this as one of the most important features of the new Act, and it will, I believe, operate most materially and beneficially upon the Birmingham workshops. It is beyond doubt that many of the tailors', milliners', and dressmakers' workrooms have often been fearfully overcrowded. As I have frequently stalked along the labyrinthine stairways and passages in Stygian darkness to find, somewhere on the third storey, or deep down in a cellar, a room full of human creatures, gas-jets, and rubbish-heaps, with all means of ventilation deliberately plugged up, my feelings must be subject for thought rather than verbal description.

" Even day work has not been free from this baneful overcrowding. Quite recently I visited a workroom with one door, closed windows, and nine persons, in a space barely enough for three, breathing an atmosphere as foul as it was confined.

" The occupier naïvely intimated that several were his grandchildren, as if these said grandchildren formed a potent influence for good in thus vivifying the air of the room. The ceiling was giving way and the limewasher had not visited for an indefinite period. I spoke firmly to the occupier as to the necessities of the case and have since seen it remedied.

" In another room at Saltley I found, in the early part of the day, 10 women in a space suited to half that number, with four gas-jets ' to warm the room ' ; of course the ventilators were purposely inoperative."

Mr. Edwards observes :—

" The establishment of a recognised minimum air space is a welcome improvement, though I should have preferred if it had been made 300 cubic feet instead of 250, and also if the same amount was required for every gas burner used.

" The temperature and state of the air in many non-textile factories and workshops during the winter months, owing to the large consumption of gas, constitute conditions of employment which could be well improved upon."

Mr. Sedgwick remarks :—

“*Defined Space in all Workshops.*—This provision of the Act of 1895 will, I believe, operate very beneficially in the interest of the workers, as it will enable them to note overcrowding and report the same to the authorities. At present but few persons know the capacity of the rooms in which work is being carried on, or the number of people such rooms should accommodate.”

The power for an Inspector to obtain an order from a court of summary jurisdiction to stop work in a factory or workshop which is in a dangerous condition will facilitate improvements. Dangerous factories and workshops.

There was a case in Sheffield of a specially dangerous structure which neither the local authorities nor H.M. Inspector had power to remedy, and in the report of the Earthenware Committee it is remarked :—

“Many old factories are, wholly or in part, unfit in sanitary point of view for occupation, and there should be some authority to close them, or whatever part of them is condemned, on the same principle as dwellings are declared uninhabitable.”

Mr. Harston remarks :—

“One of the most valuable provisions of the new Act is that which will enable steps to be taken by H.M. Inspectors to render safe the superstructures of buildings found to be in a dangerous condition. We have many flour mills in this district in which the joists and beams, supporting heavily weighted floors, are half eaten through by dry or wet rot, and very little would be required to bring the whole building to the ground. Not very long ago an accident of this kind occurred at one of the Dorsetshire flour mills. One man was killed and another seriously injured. Hitherto all we have been able to do has been to point out the great danger which existed. Local authorities have been communicated with in several instances, but the answer has always been that they have no power to take action.”

Capt. Smith, R.N., H.M. Inspector, observes :—

“Sections 2 and 4 of the Act of 1895, originally designed to meet exceptional difficulties in Sheffield, but made general in their application, will, I think, be found most valuable and meet difficulties now almost daily met by H.M. Inspectors, who too often have been considered apathetic or wanting in sympathy when palpable defects were reported or seen, for which no legal remedy existed. It is gratifying to report ready co-operation on the part of factory owners to safeguard dangerous mill-gearing and machinery; during 12 months 145 notices as to fencing were sent out from my office. These notices were acted upon readily and without delay. Statistics as to the number of accidents may be disheartening, but I attribute this to the fact that accidents are now reported; formerly they were not. I have no hesitation in saying that owing to wise legislation, the risks to workmen and women are gradually being reduced to the standard aimed at. No accident should happen which by reasonable prudence and foresight could have been prevented.”

Mr. Hoare, H.M. Inspector, remarks :—

“*Dangerous Factories.*—These are, I think, gradually dying out, but the ladders and stairs in some works, notably flour mills, malt houses, and wind mills, through being worn and at times set in one continuous

flight, and also trap doors through being out of repair and badly placed, are a constant source of danger, not only to the operatives, but to the Inspectors."

Mr. Calder, H.M. Inspector, remarks :—

"*Powers re Dangerous Factory through Structural Default.*—Of the three fatal accidents which occurred within the district during the past year, one took place in a country grain mill which was known to be structurally defective to a dangerous extent. The Procurator Fiscal alone could take action and that not until a casualty had revealed the necessity for it."

Proceedings of sanitary authorities on complaints to be given to H.M. Inspector of Factories.

Dangerous machinery.

The new clause requiring the sanitary authority to inform the Inspector of Factories of the proceedings taken in consequence of any notice of sanitary defects will, I hope, facilitate the co-operation and lead to beneficial results.

The power for a court of summary jurisdiction to make an order as to a dangerous machine on the complaint of an Inspector will provide a summary mode of dealing with dangerous grindstones, which are apt to fly into pieces with terrible results. Cases have occurred where a grindstone, which was known to be in a dangerous condition, has been worked, and there was no power for any one to interfere.

The following letter was sent by an important firm of cutlers to Captain Smith, R.N., H.M. Inspector for Sheffield :—

"Dear Sir,

15th February 1895.

"Would you kindly inform us what is the right course to pursue in case of a grinder who runs a stone which we believe to be unsound, the man being a tenant and not under our control, though working for us? We presume you have some power in these cases. If not, circumstances which have come to our knowledge seem to make it desirable that any alteration in the law should confer such powers. We are, &c."

Major Roe, H.M. Inspector, Birmingham, remarks :—

"*Power as to Dangerous Machines.*—I believe section 4 will greatly strengthen our hands in our endeavours to make machines safer to use."

The power given to the Secretary of State to issue an order applicable to particular classes of work in specified areas, where he has reason to believe out-work is carried on under insanitary conditions, enabling the Inspector to issue a notice preventing, after a month, work being given out to be done in any specified insanitary factory or workshop within such area, will enable the sweating districts to be dealt with in a more satisfactory manner.

This question was specially referred to in the report of the Royal Commission on Labour and in the report of the Select Committee of the House of Lords on the sweating system.

The clause preventing work being given out in any dwelling-house or building where an inmate is suffering from scarlet fever or small-pox, will be most useful.

Employment in places injurious to health.

Infectious diseases.

Mr. Timothy, the assistant to H.M. Inspector in Wales, observes:—

"In inspecting one of the outworker's workrooms I discovered that there had been a case of scarlet fever in the house a month or so previous. On making further inquiries, I found the sanitary authorities had taken certain precautions to prevent the spread of the fever, and had disinfected the house, but the existence of a tailoring workroom in which three or four females were employed, and in which work was carried on during the whole of the time, was not discovered, and the occupier remarked that, as they had not discovered it, she did not deem it necessary to volunteer any information concerning it. A case of this sort, in which a fever or disease might be spread all over the town, clearly proves the utility of the order."

Children are not permitted, under section 9 of the principal Act, to clean any part of the machinery in a factory, while the same is in motion by the aid of steam, water, or other mechanical power. The extension of the restriction, so far as the dangerous parts of machinery are concerned, to young persons will tend to prevent such accidents as the following.

Cleaning
dangerous
machinery in
motion.

- Age 15. Fatal. Cogs of key compressing machine.
- 14. Injured cleaning piston rod.
- 16. Leg broken in picking waste off machine.
- 13. Injured by picking waste off roller of spinning machine.
- 13. Crushed thumb, cleaning finishing machine.
- 13. Arm lacerated by screwing machine.
- 16. Crushed thumb, cleaning loom in motion.
- 17. Finger lacerated by rubber motion of carving machine.
- 17. Head injured by bolt printing machine.

Mr. Harston observes:—

"The prohibition of young persons cleaning machinery in motion, cannot be regarded as otherwise than a most humane provision, and will probably prevent hundreds of accidents every year; but the regulation might with advantage have been still further extended. Difficulties, no doubt, there are in the way of complete prohibition; but they are not insurmountable. At a large lace factory in this district, where accidents were almost of weekly occurrence, both to adults and young persons, through cleaning machinery whilst in motion, I suggested that it would surely be desirable to cease cleaning moving machinery altogether rather than have such painful consequences. The firm at first thought the difficulties in the way were too great, but promised to give the matter careful consideration. I have since received the following letter from the firm:—

"Dear Sir,

"We were busy stock-taking when you called the other day, and were not aware that you had called until you had left. Our Mr. — who saw you at the time tells us that you strongly represented to him the question of accidents. We are anxious to meet your views in this matter, and propose adding to our list of rules the two following:—

"No person under 18 years of age, shall clean any machine under penalty of dismissal.

“*No person shall clean any machine whilst in motion.*

“*Almost all our accidents of late years have arisen from non-observance of these conditions. It may occur to you that if the mill were stopped for a certain time at regular periods, for the purpose of cleaning, this would be better. This, however, would not be possible. We can only clean machines when the warps work off, some of the more important parts not being accessible at any other time.*”

“*Since this rule was put into force, nearly two years ago, I am only aware of one slight accident having occurred at this factory.*”

Position of
self-acting
machine.

The following report shows the importance of the section requiring the traversing portions of self-acting machines to be stopped with the traversing portion on the outward run.

Mr. Rogers, H.M. Inspector for Manchester, reports as follows:—

“*I beg to direct your attention to two accidents which have recently occurred in this district. Both happened to young boys in the spinning rooms of old cotton factories.*

“*In one case, a boy was ‘creeling’ behind a mule near a point where the wall of the building projected, and forgetting that at this point the ‘carriage’ of the mule ran close to the wall, and, in fact, the ‘carriage’ wheel entered it, he remained there, and was crushed between the ‘carriage’ wheel and the wall.*

“*In the other case, a boy was walking with the mule, bending to examine a roller-band he had just pierced at a point directly opposite the fixed ‘headstock’ of the other mule, and forgot to come away when the mule got near the end of its outward traverse. Fortunately the foreman (‘minder’) was near the starting gear and he reversed the motion at once, thus undoubtedly saving the boy’s life; the latter escaped with a slight bruise on the head, which was held for a moment between the ‘carriage’ of one mule and the ‘headstock’ of the other.*

“*At these two, and many other, of the older cotton factories, the mules are placed so close together, that at its outermost point the traversing ‘carriage’ of one mule nearly touches the fixed ‘headstock’ of the opposite one.*

“*It is only in the old factories into which new machinery has been introduced that the machines are crammed so dangerously close together. In modern mills there is usually plenty of room; and this fact increases the danger of allowing the traversing parts of machines to run so very near certain fixed structures, as will easily be seen. A person who has worked in a comparatively new mill, where he has been able to walk anywhere with safety, is very likely to get caught at some time if he takes a place at an old factory where the machines are close together. As you are aware, the attendants of self-acting machines get into the habit of doing things intuitively and quite unconsciously.*

“*I hope that by the next Factory Act such accidents as those described above will be rendered impossible—with machinery fixed in the future, at all events.*”

Provisions for
escape from
fire.

Various reports from H.M. Inspectors, embodied in my report for 1894, showed that the important section 7, Factory Act 1891, had received little attention from the local authorities, although that Act required that for all new factories in which more than 40 persons are to be employed there must be a

certificate from the sanitary authority that there is adequate means of escape in case of fire. Under that Act the sanitary authority may also require similar provision to be made in existing factories where more than 40 persons are employed.

By the present Act, H.M. Inspector of Factories is empowered to obtain an order from a court of summary jurisdiction requiring the provision of a moveable fire-escape or fire-escapes in any factory or work-shop where it is required.

Captain Bevan remarked in my last report on the satisfactory manner a bag fire-escape was adopted in Nottingham.

Major Roe, H.M. Inspector, Birmingham, observes :—

"I believe that the extension of the law as to the provisions against fire to workshops as well as factories most beneficial, and that in certain cases moveable fire-escapes might well be provided."

The new provisions in the Act forbidding any room being so fastened as not to be easily and immediately opened from the inside, and in new buildings where more than 10 persons are employed that there shall be either sliding doors or doors opening outwards, will facilitate escape in case of fire.

The Act further requires a certificate from the local authorities for all new workshops where more than 40 persons are employed, which will, if carried out, materially promote the security of those employed.

Mr. Knyvett reports :—

"Mr. Tozer, the widely-known chief of the Birmingham Fire Brigade, recently told me how valuable he considered the new rules having reference to portable fire-escapes."

The Act provides for the representation of workmen on an arbitration between the Secretary of State and employers as to special rules. It permits the representation of workmen belonging to the same class of employment, whether they are actually employed in the particular factory or workshop to which the arbitration relates or not.

The Act of 1895 much extends section 82 of the Act of 1878, Compensation for injury. and not only is penal compensation provided to persons injured by neglect to fence machinery, but also, if death or bodily injury is caused by any neglect of the Factory Acts or of special rules, also if injury to health is caused directly by such neglect.

EMPLOYMENT.

The question of overtime was fully entered into in my report Overtime. for 1893, pages 298 to 309, and the following extract from the report of the Royal Commission on Labour shows that the views expressed by H.M. Inspectors in my report are in general accord with those of the Commission.

Report of Royal Commission on Labour :—

"Para. 328. The evidence which we have received brings us to the conclusion that some modification should be made in those provisions

of section 53 of the Factory and Workshop Act, 1878, which permit women and young persons to work overtime for 48 days in the year in various specified occupations, including dressmaking. The number of days in which such overtime is allowed might, in our opinion, be reduced with advantage, and we think that, in the case of young persons, no overtime at all should be permitted under this section."

The provisions of the Act of 1895 as to the restriction of overtime are in accordance with the recommendations of the Royal Commission.

**Employment
inside and
outside of
factory on
same day.**

The evil which arises from women and young persons employed in factories and workshops taking work home and working at home on factory or workshop work in addition to working both before and after dinner in the factory or workshop has been dealt with in the Act, which, however, does not prevent women or young persons who have only been employed in the factory or workshop less than the legal period of employment taking work home.

Miss Abraham in one of her reports refers to a firm who had been fined for working illegal overtime and afterwards adopted the plan of sending work home to be finished after the conclusion of the legal period of employment for overtime. This evasion of the Act will now be prevented.

In one of her reports she remarks :—

"I beg to draw your attention to the excessive hours worked by women who spend the first part of the day in a factory or workshop, and serve afterwards as shop assistants in a shop.

"They are constantly employed until 9 and 10 o'clock on the first five nights of the week, almost invariably till 10 o'clock on Saturday, and frequently until 11 o'clock on Saturday.

"I receive constant complaints from the women themselves, and from societies interested in them, of the injurious effects of their excessive hours of labour."

Mr. Rogers, H.M. Inspector, Manchester, reports :—

"I think that one of the most salutary provisions of the new Act is the restriction of overtime. It cannot for a moment be doubted that the working of boys and girls of 13 years of age and upwards for a period of 14 hours daily, which is legal on 48 days in the year in many trades under the present Act is injurious to their health, and must seriously retard their physical development.

"Many women have expressed their gratification to us that the number of days on which overtime is allowed will be decreased in the new year (1896). I have found workers keeping a private 'record' of their own, and have noticed the zest with which they see the approaching completion of the 48 occasions of overtime allowed in the year. Some of the firms here exhaust their allowance in a few months—for several weeks together working four nights a week.

"During the year ending 31st October 1895 I received 11,567 notices of overtime from 628 manufacturers, and during the previous year I received 9,265 notices from 586 occupiers. The increase is, I think, to be attributed to the better regulation of the workshops, through the increased inspection they have received during the past 18 months."

Major Roe, H.M. Inspector, observes :—

“ I consider clause 16 (4) will be of benefit; but that it will be difficult to administer, owing to the words ‘not exceed the number of hours,’ and I think that in any amendment of the Acts the *period of employment* should be substituted for the words quoted. It is hard to press any employee to give evidence to be used against the employer, and my suggestion would, in most cases, obviate this necessity.

“ I think sub-section (3) is calculated to put a stop to what would practically become a regular system of overwork; but, at the same time, I foresee that in season trades it will much hamper manufacturers who, in some cases, even now, when young persons as well as women are allowed 48 days of overtime, find it is not enough, and having worked the full limit of overtime, have acknowledged to me their intention of sending work home.”

Mr. Hoare, H.M. Inspector, remarks :—

“ Where the occupier of a workshop has also a retail shop, no doubt workroom hands are too often made to serve in the shop or showroom long after they are bound to cease work in the workroom. They are also stinted in their meal hours, and robbed of their half-holiday. I think the half-holiday and the meal hours should be clearly set forth, and during those times the hands should be not only out of the workroom, if work is going on, but also out of the shop or showroom; this could be rendered much more easy if an employer was allowed to give one portion of his hands a half-holiday on one day, and the other portion on another day.

“ The giving hands work to take home should be stopped by every possible means, but giving hands parcels to deliver after working hours will not be by any means easy to check.”

Mr. Lewis remarks :—

“ The restrictions upon the employment of young persons and women in shops, as salehands, after they have been employed in the workroom for the number of hours permitted by the Factory Acts, will prove a great boon to that large class of females who are engaged in millinery establishments, both to trim in the workroom and to serve at the shop or showroom counter, as the exigencies of business demand. Many of these so-called milliners are often kept at work as salehands for hours after the end of the working day in the workroom.”

Mr. Edwards observes :—

“ *Employment of Women in Workshops and as Saleswomen.*—This restriction will more especially affect small drapers who employ one or two women as both milliners and saleswomen, and will be a great boon to women so employed.

“ It will undoubtedly be the means of preventing continual breaches of the Act, as it is a rather general custom to bring milliners out from the workshops into the shops at 8 p.m., and if a customer comes in for millinery, the order is taken and executed clandestinely after hours.

“ The extension will be the means of protecting a large number of women who have hitherto been helpless, and do service for a clause which was sorely missed from the Shop Hours Act. I feel assured that in some parts of this district women are brought from the workroom at 8 p.m. on Saturday night and kept in the shops until closing time, which generally means midnight. They are kept in the shop for the ostensible purpose of serving, but also in reality for the execution

of any millinery orders taken, or alterations to garments sold, so that the inclusion in the Act will have the effect of shortening the hours of employment, and also of removing a strong temptation to work illegally."

Mr. Crabtree reports :—

"*Employment in Shop and Workroom.*—In Birmingham this has been far too common, and we have often received verbal and written complaints of young persons being employed in the workrooms till 8 p.m., and waiting behind the counter till 10 and 11 p.m. But it has operated most prejudicially on half-holidays, when during the time the girls have been absent from the workroom, the shop has been at its busiest—this often being the time set apart for re-arranging the goods. These girls have, therefore, had no holiday whatever, except Sunday; they have simply been transferred from one room to another, but the work has not one whit abated."

Mr. Hilditch observes :—

"This will undoubtedly remove a grievance to which a number of females are at present subject. To occupiers in a small way of business, it will, perhaps, for a time, prove a hardship, as in many cases it will really mean an increase in their staff. On the other hand, I believe it will tend to reduce the hours at present worked in shops."

Mr. Sedgwick remarks :—

"*Employment as Workers and as Saleswomen.*—This provision in the Act of 1895 was much needed. I have known cases where, after being employed the usual period of employment in a workshop, young girls have been kept until 11 and 12 o'clock on Saturday nights engaged in sales in the shop occupied by the same employer."

Mr. Richmond reports :—

"Amongst the many salutary provisions introduced by the Factory and Workshop Act of 1895, probably the most drastic is that which prohibits 'overtime employment for all under 18 years of age.' Under the heading of 'Factories' probably the trades most affected by this prohibition will be those of 'Letterpress Printing' and 'Bookbinding'; but on examination it will, I think, be found that the restriction affects them much less than would at first sight appear. Printers (including lithographers) and bookbinders in Liverpool almost all work ordinarily between 8 a.m. and 6 p.m., and 8 a.m. and 1 p.m. on Saturdays, or an average of 9½ hours per week less than the law allows. Here, then, is ample margin for extra work at busy times without 'overtime' within the meaning of the Act. In fact, I see no reason for granting overtime to any trade which habitually works considerably less hours than the law allows. The case of 'Workshops,' such as dressmaking and tailoring, differs somewhat from the above in that they habitually work nearly the full time allowed by the Act, and perhaps at present some little allowance, such as the new Act prescribes, may still be necessary in the case of mourning orders."

HOLIDAYS.

Holidays in
England and
Wales.

The fixing the days to be observed as holidays in England and Wales will be a great convenience both to the occupiers and H.M. Inspector as whilst in the exceptional cases where it is

desired to give different holidays it can be done in the manner provided for in the Act it will obviate the necessity for many thousands of notices being hung up in factories and workshops and forwarded to H.M. Inspectors.

ACCIDENTS.

Sections 18 to 21 requiring certain accidents to be reported by occupiers of workshops as well as factories, a register of accidents to be kept by the occupier, the adjournment of inquests by the coroner for the attendance of an Inspector of Factories, and the power given to the Secretary of State to direct a formal investigation of an accident occurring in a factory or workshop, will facilitate the inquiries into the cause of accidents. Cases have occurred where a workman has fallen into a blast-furnace, and where the body being all burned, there were no remains on which an inquest could be held, but the 21st section will permit a formal investigation and the person appointed to hold the inquiry is empowered to summons witnessess and require the production of all books, papers and documents which are considered important.

Notice of
accidents and
inquests.

LAUNDRIES.

Laundries were not within the old Factory Acts so far as the hours of work are concerned, washing soiled linen not being a manufacturing process. The Royal Commission of 1876 proposed that laundries should be brought under regulations, page xx., paragraph 30 : "Similarly the apparently accidental absence of "a word in the same definition of a manufacturing process, "implying the various operations of cleaning, washing, and furbishing an article by way of trade, but not in order to its sale has "operated to exclude those employed in laundries, &c. To all "these cases we recommend the extension of the definition "in question." And, page xcviij. : "We recommend that the "definition of work to be regulated by the Act should include "labour in or incidental to the washing, cleaning or furbishing "any article."

Attention was drawn especially to steam laundries in my report for 1893, pages 328 to 330, and the necessity shown for provisions requiring the fencing of engines and dangerous machinery, the regulation of the temperature in the ironing rooms, the protection of the ironers from the heat of the stoves, preventing offensive fumes from the gas irons, improved ventilation, and the securing of the proper condition of the flooring and drainage.

These matters have received attention in the new Act, and the exemption and elastic conditions as to hours of work arranged whilst the bill was before the Grand Committee of the House will, I think, enable the laundry sections to be enforced without inconvenience to those concerned.

Mr. Knyvett remarks :—

" I most cordially approve of the extensions of the Act in the various directions in which these have been made; but I fear that the regulations as to the hours of work permissible in laundries will be of little avail to avoid overtime so long as the somewhat senseless power is accorded of daily altering the period of employment. In connection with this it is only necessary for anyone having the most rudimentary acquaintance with factory life, to reflect how absolutely useless the Factory Acts would have been during the many years of their existence, if the hours in factories and workshops had been regulated on this principle. It is only to be hoped that this power may be rescinded at the earliest opportunity."

I differ from Mr. Knyvett and consider the exceptional work carried on in laundries requires elasticity and that the notice of the period of employment hung up at the commencement of work is all that can reasonably be required.

Major Roe, H.M. Inspector, Birmingham, observes :—

" Clause 22 (1) (V.). I consider this sub-section a weak one without a limit as to the number of times the period of employment, &c., may be changed in any 12 months, or at what intervals. The hands might be told to come at 6 a.m., and kept waiting for hours before being employed and then worked the limited number of hours, possibly into the early hours of the next morning and yet it would not be illegal.

" Otherwise I believe this extension of the Act would be beneficial to a large number of both employers and their hands, and that it will be accepted as a boon by both, when it is understood and in working—although in sub-section (3) (c) I should have preferred the exemption to those laundries where 'not more than two persons dwelling elsewhere' were so worded that where only adults are employed in a workshop laundry it should be exempted."

Mr. Crabtree, H.M. Junior Inspector, Birmingham, observes :—

" In my recent visits to laundry factories several items of fencing have been found wanting, but the occupiers have expressed their entire willingness to comply with the Act by guarding all mill-gearing and all exposed cogs of machines. In one factory the drainage was very imperfect, but remedial measures were then in progress. The new Act will probably make itself felt most powerfully in the laundry workshops where the practices of the past have been contemptible. In these young girls have been employed after leaving school in the afternoon to work to 9 and 10 p.m. for a paltry sixpence. They have similarly been employed on the Saturday. Women and young persons have left their own employment in other workshops at 7 and 8 p.m. to continue work in a laundry up to midnight, and have been admitted to the same form of slavery during the whole of Sunday. The regular employees in these laundry workshops have, especially during the latter part of the week, commonly worked into the morning hours, leaving at 1 and 2 a.m. and on Sundays at 8 a.m., having both night and day worked in rooms with close atmosphere and excessive temperature. We may now hope for a considerable improvement in this sphere."

Captain Smith, R.M., H.M. Inspector, Sheffield, remarks :—

" It is, I think, a matter for congratulation that some protection will in future be afforded to those engaged in laundries where the risks from

machinery, fumes, deficient ventilation, &c., are certainly as great as in other works, and where the manual labour is often arduous, but I foresee great difficulties in giving effect to the beneficent intentions of the Legislature. One of the best safeguards in the Factory Acts disappears, I mean the enactment that work shall be between certain hours a new departure in factory legislation appears, and it is enacted that the period of employment may not exceed a certain number of hours. The difficulty—indeed the almost impossibility—of proving the actual number of hours that any person has worked will, I fear, generally make conviction impossible."

Captain Bevan, H.M. Inspector, Southampton, remarks :—

"The extending of the Act to laundries will no doubt work a great improvement, especially as to hours of work; in the Midland they tend to be excessive, even Sunday work occurring; in the South moderate hours are worked in the steam laundries, perhaps owing to the great number of small hand-laundries which secure a fair share of the trade, and perhaps work longer hours.

"I have received several requests from the managers of steam laundries to visit their establishments with a view to secure fencing of machinery, ventilation, and suitable position of ironing stoves."

Mr. Harston observes :—

"The extension of some of the provisions of the principal Act to laundries has been long called for, and will be greatly valued by thousands of workers in these places; though it is perhaps to be regretted that more extensive powers have not been given for more thoroughly checking the hours worked."

Mr. Edwards remarks :—

"The legislation for laundries is probably one of the most popular features of the Act, not only with those directly benefited but also with the general public, I have recently visited all the laundries in this district, and only in one case, that of the occupier of a hand-laundry employing about 10 females, has the inclusion met with any resentment, whilst with the workers it has met with a warm reception.

"Upon first consideration the restriction of the hours of employment appeared to be the all important feature, but I found during the course of my visits that the safety clause will also prove an important factor in our inspections."

Mr. Bellhouse, H.M. Inspector, Dublin, remarks :—

"The extension of the Act to laundries is of course a very important point in the new Act. There was, as I need not remind you, a considerable amount of opposition to this matter, more especially in Ireland, with the result that convents and such like places have been excluded from the provisions of the Act, and it is now I think, the only point upon which the occupiers of laundries, other than convent laundries, feel sore. Several occupiers have said to me that they cannot think it is fair or right. They say they will be obliged to refuse to take in washing, on account of the new regulations, but that the convents will be able and willing to take it in, and will not hesitate to work longer hours than they would be able to do under the Factory Act. I cannot myself think that this will prove to be the case, and I hope and believe that time will show that the ordinary laundries do not in any way suffer from an exclusion of convent and other similar laundries. I have been much gratified to find that, now that the regulations have

become law, the owners of laundries are at once going into the matter, and making arrangements to fall in with the regulations. I have already had visits from the managers of several of the big laundries, and they have one and all expressed their wish to comply in every particular. This, I think, is very satisfactory, and I anticipate little or no trouble in getting the requirements of the Act carried out.

Mr. Snape, H.M. Inspector, Belfast, reports:—

“With reference to the clause in the 1895 Act which enacts ‘that gas irons which emit noxious fumes shall not be used.’ I beg to inform you that a new iron has been patented by Messrs. Eves and O’Brien, which claims to meet the requirements of the Factory Act. I beg to forward to you a statement of Mr. Eves, one of the patentees.

“Within the past three months a new gas iron (Eves and O’Brien’s patent) has been introduced into a few smoothing-rooms in Belfast. It fulfils the requirements of the new Factory Act for 1896 as applied to laundries, because no noxious fumes are given off. The gas and air are burned in the closed body of the iron and the products of combustion are carried by a flexible steel tube to a duct connected with an exhaust fan. The partial vacuum created by the fan draws in through a regulated opening in the gas supply pipe a sufficient quantity of air for the economic combustion of the gas. The products of combustion are delivered by the fan outside the building instead of below the face of the worker, as in the case of irons hitherto used. A good feature in the arrangement is that if there are any leaks in the pipes or fittings, or in the box of the iron, the air of the apartment is drawn in instead of any gas finding its way out.”

“The owners of the establishments where the fumeless exhaust gas iron has been applied have spoken highly of it from an economical point of view, as well as from the standpoint of health. In one case a saving of $37\frac{1}{2}$ per cent. in the gas bill was noted, as compared with the consumption of the old evil-smelling iron; and in another case a saving of 20 per cent., and in a third the large saving of 50 per cent. The difference in the condition of the atmosphere of a room fitted up with the new irons and that of one where the old irons are used is very great. In the former case it is impossible to detect that gas is being used.”

GAS IRONS.

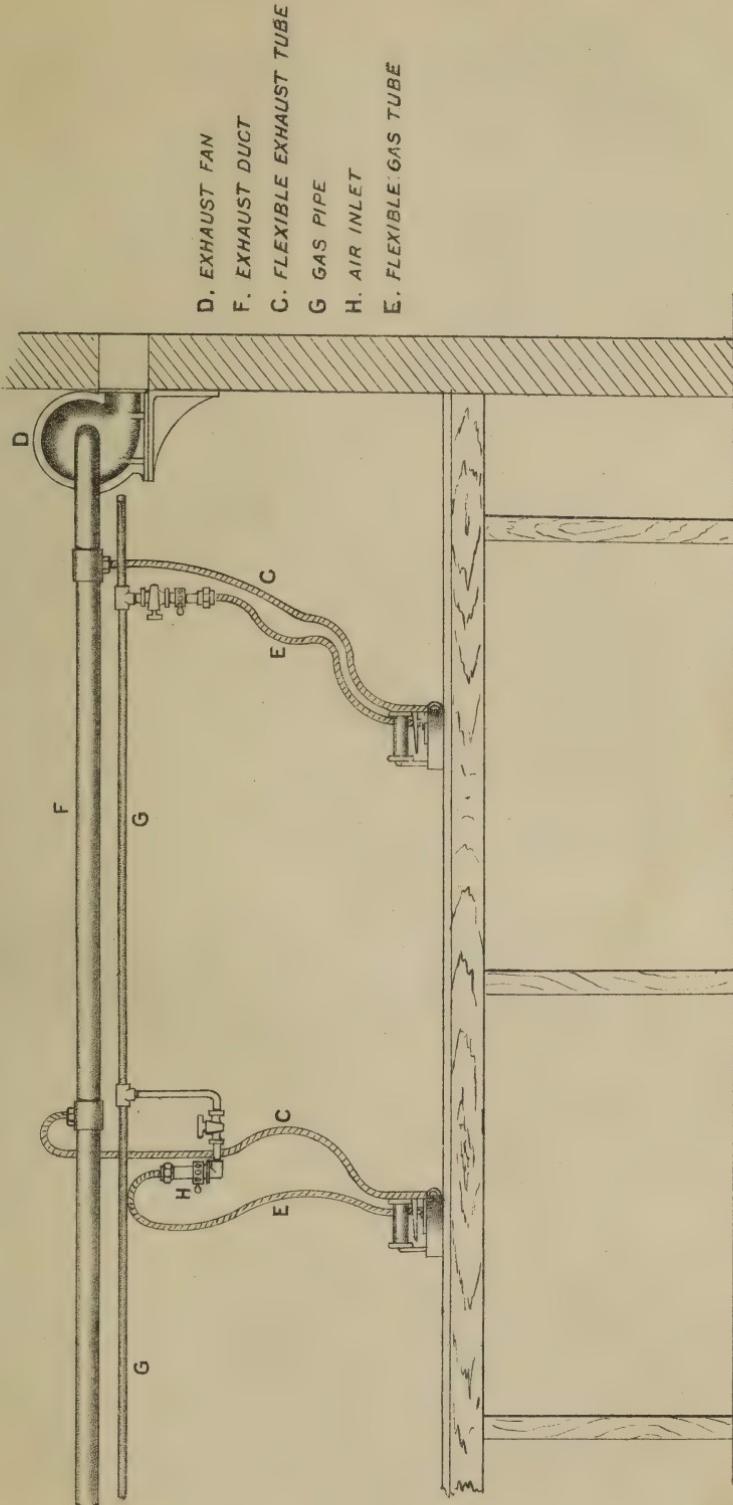
The manager to a clothing factory in Ipswich who had used an improved gas iron observes that it consumes less than half the amount of gas and gives more heat than the old one. It emits no smell. Neither the pressers nor females now suffer from inflamed eyes which the smoke and flames from old irons produced. The gas is so evenly mixed with air that the carbon is consumed, therefore there is no smoke. The iron requires no cleaning, they have been in use for four months, and they are as clean now as when first fixed, whilst the old ones had to be cleaned every week to get them to burn freely.

A corset manufacturer remarked that these gas irons have more than realised my expectations in every respect.

DOCKS AND WAREHOUSES.

Docks, wharves, quays, and warehouses are now included under the factory regulations, to a limited extent, the main effect of

EVES & O'BRIEN'S PATENT FUMELESS SMOOTHING IRON.



section 23 being to require accidents to be reported to H.M. Inspectors of Factories instead of to the Board of Trade. H.M. Inspectors will not supervise the general arrangements and operations of docks, &c., but when necessary experts will be employed by the Secretary of State, under section 21, to inquire into accidents occurring in such places.

Mr. Richmond, H.M. Inspector for the Liverpool district, reports:—

"The inclusion of docks, quays, &c., under the Act, will, in this district bring a large amount of machinery, in the form of cranes, pumping engines, &c., under inspection. The returns I have obtained show an aggregate of 110 docks in the Liverpool district, each dock of course possessing the necessary amount of quayage. But I anticipate that the largest amount of work will, in connection with docks, consist of inquiries into accidents and attending Coroners' Inquests. I lately had an interview, by request, with the Chairman and Secretary of the Shipowners Association in Liverpool, who were desirous of learning from me my views as to the manner in which the Act would operate as regards themselves. They claimed that on their representations the word 'ship' had been struck out of the Bill as first proposed. I informed them that that was so, but pointed out that the words (section 23 (a)) 'and so far as relates to the process of loading or unloading therefrom or thereto, *all machinery and plant used in that process,*' would necessarily include the steam winches on board the ship, but that the following words (b) 'as if the person who by himself, his agents, or workmen *temporarily* uses any such machinery for the before-mentioned purpose were the *occupier* of the said premises' imposed the duty of reporting accidents which might occur in the process of loading or unloading, upon the master stevedore, lumper, or porter, and not upon the shipowner; that as *Shipowners* they were exempt, but that as *Master Stevedores*, where they did their own stevedoring, they would be responsible.

"The Dock Board here licenses nearly 500 master stevedores, lumpers, and porters to go upon the docks and quays and engage men to do the loading or unloading of vessels. I have therefore forwarded to the whole number the necessary instructions under the Act, but as many of the shipowners act as their own stevedores—for which purpose one of the firm becomes a licensed stevedore—some shipowners will be included amongst them.

"In connection with accidents at the docks, I append a newspaper cutting consisting of a letter from the Secretary of the National Union of Dock Labourers, on the subject. It will be seen from this that the causes of accidents at the docks are numerous.

"*To the Editor of the 'Daily Post.'*

"Sir,

"I TAKE the liberty (and not for the first time) of trespassing on your space in order to call attention to the alarming number of accidents of almost daily occurrence at the Liverpool docks in discharging and loading ships, all of which with, a little more care, could be avoided.

"Scarcely a day passes over without reports being forwarded by our branch secretaries of serious accidents to our members, of which the following are a sample of the least serious:—

"A Bootle man, working at a ship, has his body seriously bruised and his thigh crushed by the fall of shute, owing to the insecure manner

in which it was lashed; these slutes, weighing a ton, being in the majority of cases only secured with strands of a worn-out rope used up in hoisting and lowering cargo.

" " Another man, working at the Union Dock, is severely injured by the breaking of a rope used in discharging deals. Both of these accidents happened within two days of each other, while there are others of which we never receive any report, because they do not come under our supervision, being non-members of the union.

" " During the past year I have made a special point of collecting statistics of accidents at the docks, and which it is a rather mournful consolation were productive of good in the inclusion of inspection of plant and gear in the Factory Act Amendment Bill recently passed into law, a perusal of which is in itself an eloquent argument for better supervision, as follows:—

" " 1. During three months of the year there were four cases arising from the breaking of fore and aft spans, two of which were fatal—all caused by the spans being over-strained by excessive weights.

" " 2. Unsafe machinery—viz., ship's winches—19 cases, 4 fatal. The majority of these cases are owing to boys being employed in the place of men. Boys are apt to be either inexperienced or careless in the performance of their duty, and we have had cases only very lately where it was proved in a Board of Trade inquiry under the Notice of Accident Act that boys had worked as much as thirty hours without any interval for rest.

" " 3. Unsafe staging, 30 cases, 7 fatal, all caused by insecure lashing or rotten, weather-eaten planks being used.

" " 4. Unsafe ladders, 7 cases, 6 fatal. In this respect a large percentage of the total accidents are entirely due to the position in which the ladders by which the men have to descend and ascend to and from the ship's hold are placed, the men in many cases having to climb over the ship's winches and hang on to the combings with their hands while they grope for the rung of the ladder below their feet. In the majority of these cases the better part of the rungs are broken by the slings of cargo coming into contact with them, and I have known many cases where men have missed their footing on this account, and have been killed by falling below.

" " 5. Blocks and gins, 5 cases, 1 fatal, the man being killed by the breaking of a pin upon which the gin-wheel revolves, while the others were all seriously injured from the same reason.

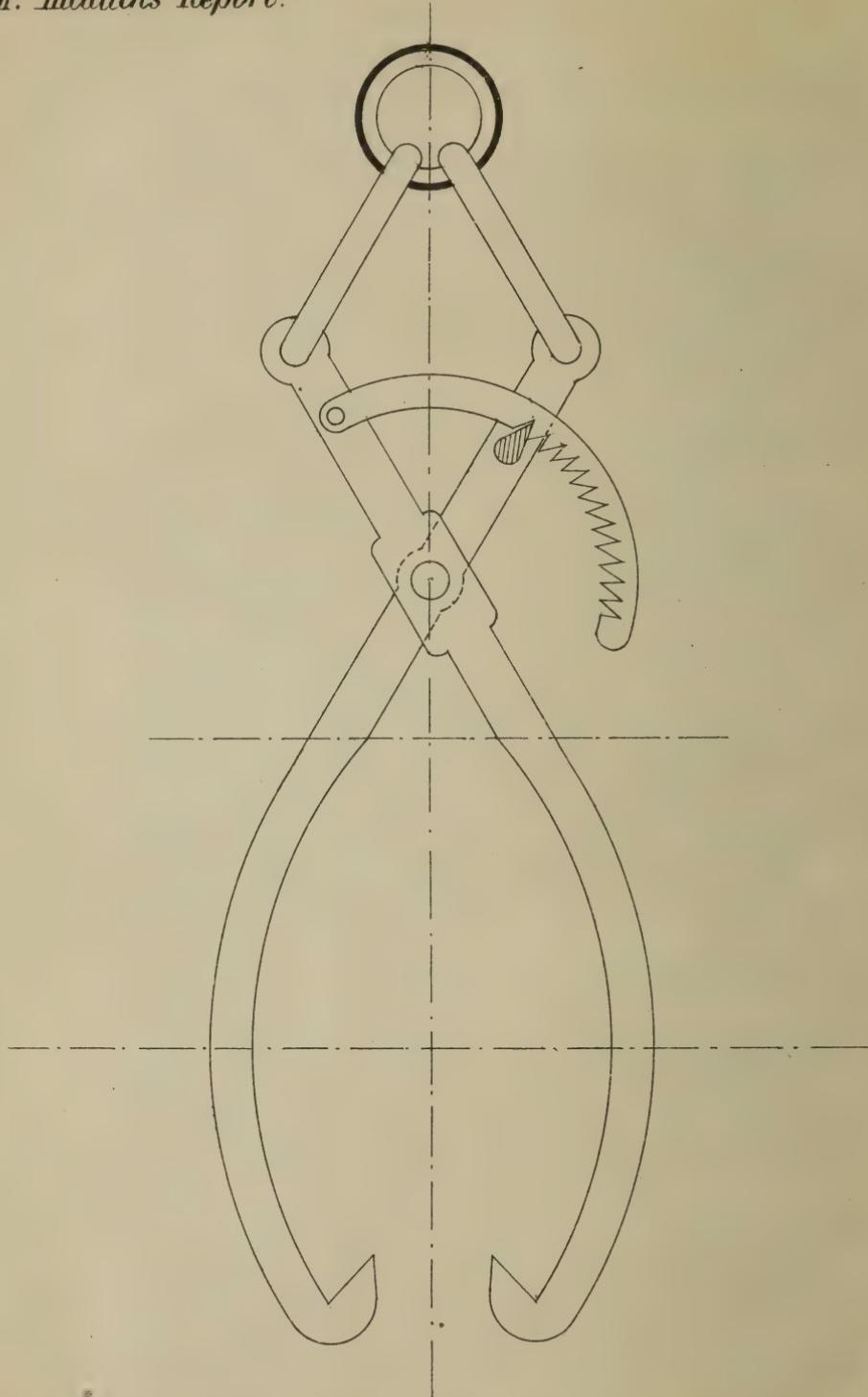
" " 6. Rotten slings and lashings, 12 cases, 1 fatal. None of the slings used are stamped or certified to carry a certain weight, and the consequence is the breaking of the slings by being overweighted.

" " 7. Fall from aloft, owing to defective foot-ropes, when rigging gear for discharging, 2 cases, both fatal.

" " In all, within a period of three months, 92 cases, 29 of which were fatal.

" " I am convinced that there are many employers who are unconscious of the cause of these accidents, and who, were they conscious, would at once take steps to remedy them by providing sound plant and gear, which in the end would pay them much better; but the fact cannot be disguised that there are others who continue to use the same gear over and over again, even after it has been proved that the gear is not capable for the work, and it is for this reason that I have been working for the past 18 months to secure legal protection for dock labourers by the extension of the provisions of the Factory Act to the conditions of labour of a body of men who have so long been neglected by our Legislature.

M^r Hilditch's Report.



**SAFETY HOOK OR DOGS, DESIGNED BY M^r R. JONES,
JOHNSTOWN WAGON WKS. RUABON.**

" " The fruits of our labour will be seen on the 1st of January 1896, when the provisions of the new Act come into force, and as one of the victims of the present system I hail its advent with satisfaction, and for which we may largely thank the general election and the eagerness of politicians to stand well in the eyes of their constituents; for up to the very eve of the general election the dock clause was bitterly opposed by politicians of both parties representing the shipping interest on the committee, so that even general elections have their advantages.

" " In the meantime, let me appeal in the name of common humanity to those employers who are built that way to have a little more consideration for the lives and limbs of the men whose precarious employment at the docks compels them to take any and every risk to earn a living.

" " Yours, &c.,

" " JAMES SEXTON,

" " General Secretary of the National Union
of Dock Labourers."

" " 46, Hanover Street.

" In preparation for the new Act a very large number of warehouses have been visited by Mr. Jackson and myself, and a list has been compiled of about 1,300 warehouses, almost all of which have some kind of power, either steam, gas, or hydraulic, for hoisting purposes. These are exclusive of warehouses attached to factories, which have previously been under the Act as parts of factories. Those with hydraulic power will require but little inspection, having no machinery to speak of, whilst in the case of most of the rest one steam or gas engine works the hoists in two or three warehouses, a shaft running from one to the other. All the engines I have seen at present will need fencing to bring them in accordance with the provisions of the Act. At none of them are safety belts in use such as are now seen in many mills in Liverpool and elsewhere. I trust the day may come when these belts will be in general use wherever hoisting is done at great elevations."

Mr. Jackson reports:—

Warehouses.—The extension of certain provisions of the Act to warehouses is very necessary. After making a large number of visits to warehouses in Liverpool I am convinced of the necessity of the 'safety' clauses. A very large number of gas engines are used, and in no single instance did I find a guard to the fly-wheel, most of them just being cased round with boards, &c., to form a small engine house. The shafting also in many cases is too low, the brake-drums unguarded and dangerous. In one case where a steam engine is used to compress air for working the hoisting gear, the fly-wheel and cranks are unguarded, and there is a passage (only 2 feet wide) between the rim of the wheel and the wall, which is the only means of access to the far side of the engine.

" With reference to the prevention of accidents in warehouses I should strongly advocate the issue of an order under the 'special rules,' making it compulsory (1) for men engaged at 'teagle-doors,' above the second storey, to be provided with and to use 'life belts.' (A life belt is a broad strap fastened round the man's waist, with a rope attached to it and fastened at the other end to the ceiling of the building, so that in case he fell out, he could not fall more than a few feet and would be able to get back into the room with ease and safety.) (2) For all ropes and chains used for hoisting to be periodically inspected and tested by

qualified men, and a record of the inspection and testing kept at the warehouse and signed by the person inspecting, &c.

TENEMENT FACTORIES.

Substitution of owner for occupier in tenement factories.

Sections 24 to 26 relating to tenement factories will be specially useful in Sheffield, where often one person is landlord of all the rooms and workshops in a large building in which he provides power; he lets the rooms, and neither occupies any of them himself nor employs any of the persons at work there; those hiring the rooms, sometimes sublet and the numerous tenants, who are constantly shifting, rendered the regulations of the Factory Act unworkable.

Captain Smith, R.N., H.M. Inspector, Sheffield, observes:—

“I need hardly say that I felt more than grateful when the Factory Act of 1895 became law. Many of the clauses will be of great value in Sheffield, where, owing to exceptional conditions of labour, special legislation had become a necessity. That this necessity existed, perhaps no better proof is wanted than the fact that far reaching proposals, largely affecting Sheffield, were submitted to representative bodies, the very ancient and very influential Cutlers Company, the Sheffield Chamber of Commerce, the Sheffield Federated Trades Council, who all most carefully scrutinised these proposals. Suggestions from these bodies received careful consideration, with the result that when the clauses most affecting Sheffield were considered in Grand Committee, hardly an objection was raised.

“It is no small gratification to know that the gratitude of Sheffield operatives was expressed by representative organisations of workmen, who passed resolutions thanking the Secretary of State, the local members, and others, who had considered their legitimate wants.

“However good an Act of Parliament may be, it is generally found that improvements on points of detail can be suggested, which in the heat or hurry of debate may have been forgotten, or for good reasons not urged.

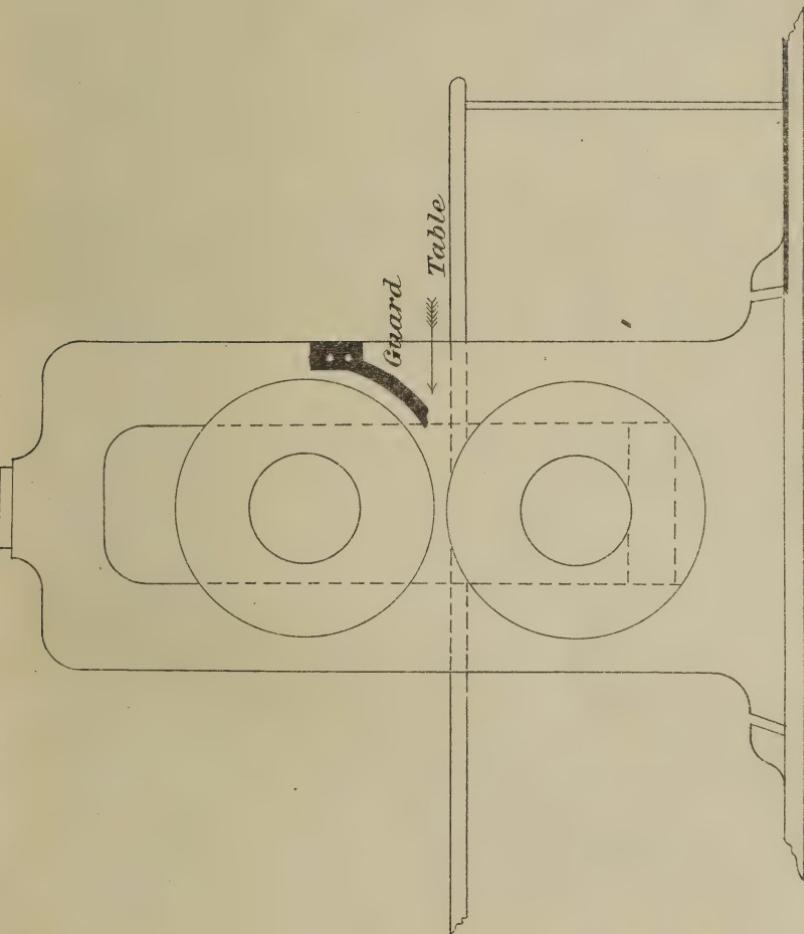
“In the Bill prepared in 1895, section 21, paragraph 2, we find that the times specified in the notice required to be kept affixed by the owner in a tenement factory shall apply to all the factories in the building, but that an occupier whose time varied from the general custom should affix a separate notice for his room or factory.

“The Act, by section 24, paragraph 2, says ‘Where different industries are carried on in the same tenement factory, the obligation to affix the notice required by section 19 of the principal Act shall be on the occupier and not on the owner.’ The effect of this in Sheffield is exceptional, and I think was not understood.

“In many ‘wheels’ there are from, perhaps, fifty to many hundreds of cutters and grinders, all legal ‘occupiers,’ the presence amongst them of *one* occupier carrying on a business other than the staple trade would mean that one and each of those occupiers must affix an abstract—there would sometimes be ten or twenty in one room; hundreds in one factory. This, I venture to think, was not intended.”

Major Roe, H.M. Inspector, Birmingham, observes:—

“Although cutlery is not turned out in my district to a large extent, still there is grinding carried on. Swords, matchets, street toys, glass,



END ELEVATION OF STANDARD AND ROLLS FOR POLISHING HAND MADE PAPER SHEWING GUARD IN POSITION.

Above guard consists simply of a stiff plate of sheet iron curved inwardly towards the rolls and fastened by studs to side of standard.

and other grinding being done here, and I think that the schedule to this Act should have terms applied which are more explicit than "locally known as" for the terms drumboards, scotchmen, are not familiar terms here.

"I consider that section 25 (3) instead of being confined to places where grinding or cutlery is carried on should be extended to all mill tenements."

BAKEHOUSES.

Section 28 extends the special sanitary provisions to all bakehouses instead of limiting them to places having a population of more than 5,000, and prohibits the opening of new underground bakehouses.

SPECIAL PROVISIONS FOR HEALTH.

The special provisions for health in section 29 will enable H.M. Inspectors of Factories to trace the places where persons suffer from lead, phosphorus, or arsenical poisoning, or anthrax. This clause was recommended by the Association of Certifying Surgeons, and by the Committee on Factory Statistics, of which Dr. Whitelegge, Medical Officer of Health for the West Riding of Yorkshire, was a member.

Cases of
poisoning to
be notified
to chief
inspector.

Mr. Sedgwick reports:—

Notification of certain Diseases.—Such a provision is necessary in all cases of illness caused by processes, worked under special rules, as dangerous trades. Sometime back Mr. Hoare (then at Wolverhampton) informed me that a female was lying in an unconscious state suffering from lead poisoning, and brought on by working at an enamelled iron-plate works in Bilston. I visited promptly, and found the poor girl in a very sad condition, colouring matter issuing from mouth and nostrils; thus she had lain for several days. She recovered after a long and painful illness. Mr. Hoare followed with another case of precisely the same character. Whilst investigating this case three others also came to my knowledge, in all of which the illness was caused by lead-poisoning. Without in any way wishing to impute improper motives to the doctors attending these cases, or the employers of the girls, it is a fact that in all probability these cases would not have become known, and the evidence obtained would not have reached the Home Office but for the information given to Mr. Hoare, and by him sent on to me. Under sec. 29, Act 1895, such cases will, at once, come under the notice of an inspector, and thus he investigated and reported upon immediately."

Mr. Jackson, remarks:—

"This very excellent provision of the new Act might, I think, be extended so as to make it compulsory for all house surgeons of hospitals, &c., and even general medical practitioners, to send notice to H.M. Chief Inspector of all cases of accident occurring in a factory or workshop treated by them. We should in this way obtain a more complete return of accidents than under the existing method. My suggestions of course being that the report be in addition to, and not in place of, the reports now sent."

Lavatories.

The thirtieth section will be most useful, as in some works where special rules have not been considered necessary lead, arsenic, and other poisonous substances are used in some departments, and it cannot admit of a doubt that in such parts of the works suitable washing conveniences should be provided for the use of the workpeople.

Mr. Knivett remarks :—

“ While welcoming the compulsory provision of lavatories in the case of dangerous trades, I look forward to the time, which I believe will assuredly come, when there will be a compulsory sanitary appliance to be provided in the case of all factories and workshops where any person is employed. There is, to my mind, no reason whatever why this provision should not be universally compulsory. There cannot be an inspector who is not frequently shocked at the personal filth and dirt of far too many of the operatives in the smaller class of factories and workshops; and although it is obvious that dirt is a necessity of many occupations, of metal polishing for instance, it is none the less obvious that it is often easily removable, and that the worker would gain in health, in self respect, and, by no means least, in personal appearance by the removal. No elaborate lavatory arrangements are necessary, but the basin, the water, and the soap should be within the reach of all our working classes.”

Mr. Jackson observes :—

“ The provision of washing accommodation in factories, &c., where lead, &c. is used will, in my opinion, be of the highest practical value in preventing lead, &c. poisoning. And as I advocated in a report I had the honour to make to you earlier in the year concerning lead poisoning (from chrome-dyed yarns) in dye works, might, with advantage, be extended to every factory and workshop.”

**Temperature
in factories
and workshops**

The Medical Officer of Health and Captain Smith, R.N., H.M. Inspector for Sheffield, as well as the female Inspectors, called attention to the necessity for this clause, complaints having been received of girls and others being employed in workrooms at a very low temperature, and without any provision even for drying wet clothes in very inclement weather. On receiving complaints, H.M. Inspectors had no power previously to remedy the evil.

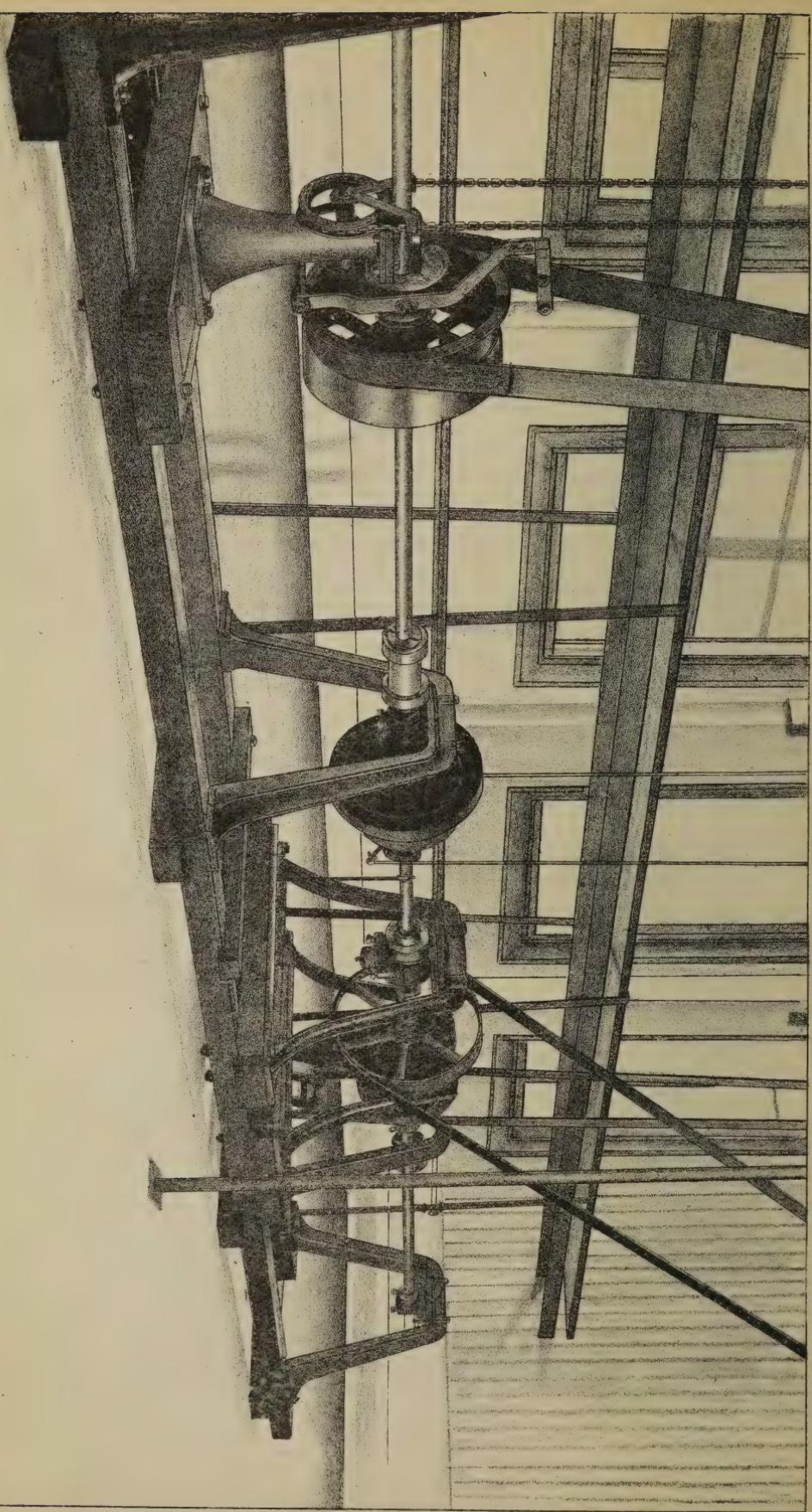
During the last severe winter complaint was made of the condition of a workroom which was cold and draughty, and where the girls had to remain in their wet clothes without fire.

Both the inspector and medical officer of health felt it might seriously affect the health of the workpeople. The medical officer of health wrote :—

“ I have visited and fully concur with your opinion as to the insufficiency of the heating of the mantle workshop and the presence of draughts, and fear the law gives me little power to provide a remedy, but I have written to Mr. —— and hope that he will recognise the justice of my demands.”

Miss Abraham observes :—

“ In many factories and workshops no heating apparatus is provided, and the workpeople complain of the injury to their health which is



caused by working during a considerable portion of the year in a very low temperature."

Mr. Cramp remarks :—

"A matter often brought to our attention is cold and draughty workshops, no fire, and I think some authority should have power to check such inhumanity."

Miss Paterson received the following letter :—

"You might kindly call and see the premises of _____, mantle makers. A friend of mine was off work for some months last winter owing to a severe cold caught for want of heating apparatus in their workroom."

MISCELLANEOUS AMENDMENTS.

Parliament has frequently asked for returns of the number of persons employed in factories, but the collection of these returns has been difficult and unsatisfactory in the absence of statutory powers to call for them. The Committee on Factory Statistics very strongly recommended that there should be power to obtain such returns.

The annual return required by section 34 will meet the difficulty so far as the number of persons employed is concerned.

Section 22 of the Public Health Acts Amendment Act, 1890, provides that every building used as a workshop or factory shall be provided with sufficient sanitary conveniences, and where persons of both sexes are employed, with separate accommodation for each sex. This Act is, however, an adoptive Act and is not in force in all places. Section 35 of the Factory Act, 1895, applies the provision to places where the Act of 1890 is not in force. The result will be that where the Act of 1890 is in force the provision will be enforceable primarily by the sanitary authorities, and in case of their default by the Inspectors of Factories under section 4 (1878), as supplemented by the Act of 1891. Where it is not in force, the provision will be enforceable primarily by the Inspector of Factories.

Mr. Hoare, H.M. Inspector, remarks :—

"Sanitary Conveniences."—Some limit should be recognised and defined by the local authority for these, and as to the numbers using them, according to the description, and it should be made imperative that they are kept in proper order; unfortunately hands give a great deal of trouble in some works by their abuse of the closets provided. Where closets are erected inside a workroom, or are made to open directly into a workroom, it is very difficult to ventilate them satisfactorily, as the warmth of the workroom causes the air to pass through the closet into the workroom. I consider under no circumstances should they be erected inside a workroom, but local authorities think otherwise.

"I also find privies which discharge into manure pits are most objectionable, and I always report them as such to the local authority.

"The best closet arrangements I have seen are those fitted with self-flushing tanks; other water-closets are so likely in frosty weather to get their water supply cut off."

Mr. Calder, H.M. Inspector, Aberdeen, remarks :—

"While H.M. Inspector could previously prosecute for general want of sanitation and cleanliness, it was difficult in country areas to get separate conveniences, unless the local authorities were prepared to take action. The recent enacting that failure to comply with this requirement is a want of conformity to the Factory Acts should remove all difficulty in bringing about compliance with the law."

Employment
8 a.m. to 8 p.m.

The thirty-sixth section provides a simplification of procedure which gets rid of section 42 of the Act of 1878. Formerly, if a firm wished to have the period of employment from 8 a.m. to 8 p.m., it was necessary to have an order from the Secretary of State, hang up a special notice in the factory, and send a copy to the Inspector of Factories for the district. The section will effect a great simplification of machinery but will make very little difference in practice, as the exception already includes practically all those cases where those hours are considered desirable.

Power to
treat separate
branches as
separate
factories.

The power given by the 39th section will be specially valuable in certain trades where the departments are entirely distinct and work separate hours; it will much facilitate work in season trades without lengthening the hours of the individual women employed.

Particulars
respecting
wages.

The 40th section as to particulars to be furnished respecting wages in certain trades carries out the object of section 24 (1891), but extends it to all pieceworkers in the textile trades, whereas the Act of 1891 applied only to certain weavers, winders, and reelers.

Mr. Knyvett observes :—

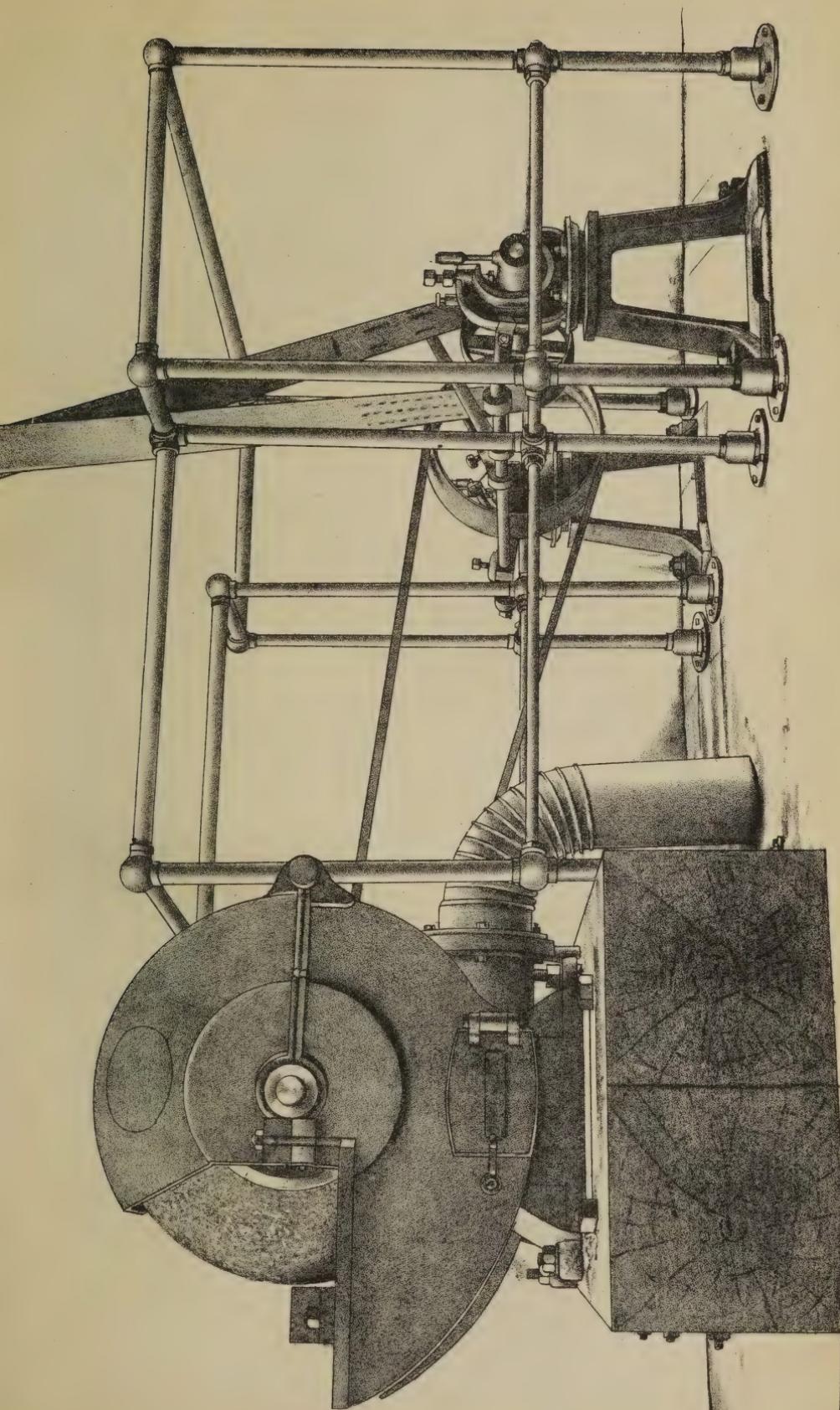
"By your instructions I made a report some little time ago, and I desire to repeat now what I then stated, that I can see no reason why that clause should not be extended to the brass, or indeed to any other non-textile trade, if it is proved to the satisfaction of the Secretary of State that the application thereof is desired and needed by the operatives in the industry. With particular reference to the brassworkers, it appeared to me that there certainly existed in some classes of factories a necessity that the men should be more carefully and strictly informed at what rate of wages they were being employed, and if the Government assumes to itself the duty of interfering in questions of this nature, it appears to me that it would do so as beneficially in such cases, as in those already dealt with in the textile trades."

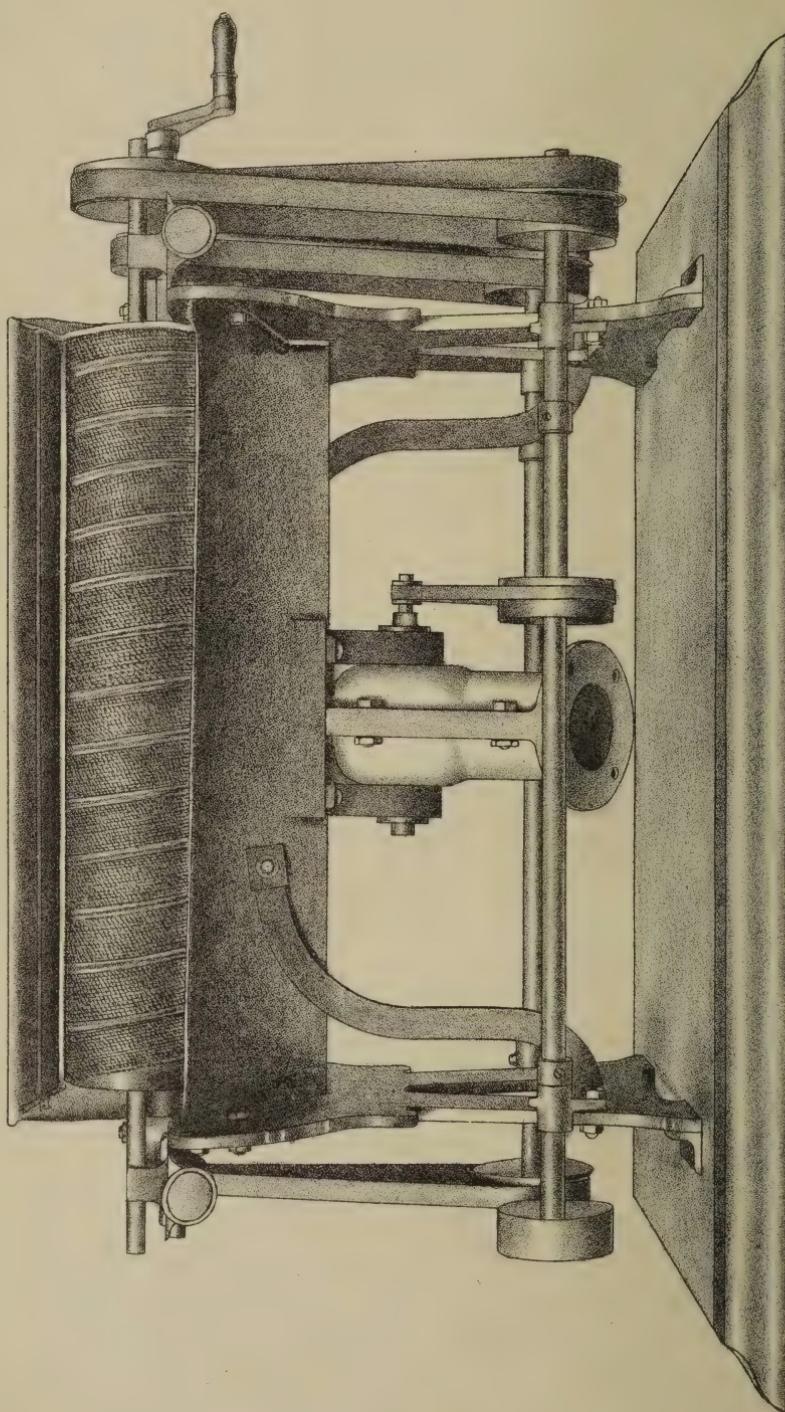
Notice to be
sent of existing
workshops.

The effect of section 20 (1891), was that notices of workshops were not required except in the case of workshops first occupied as such after the date at which the Act of 1891 came into operation, viz., 1st January 1892. The object of section 41 is to require similar notices to be given of workshops in occupation before that date.

Outworkers.

The amendment and extension of section 27 (1891), respecting the list of outworkers by section 42 (1895), will make the requirements of that section much more effective. That section only required those who *have factories or workshops* to keep lists of outworkers so that a merchant in the city, who employs one man as a cutter out and delivers cloth to two or three outworkers had





to keep a list; his neighbour, who only gives out the cloth, but employs a large number of outworkers had not, under the old law to keep a list.

All merchants are now placed in the same position, and the occupiers of all places from which any work of making up apparel for sale is given out are required to keep a list of outworkers and forward a copy to the Inspector of Factories for the district twice every year.

Mr. Knyvett remarks :—

“The new Act is full of great possibilities which I feel sure that I am not alone among my colleagues in hoping may be welded into shape by a codifying Act. And realising the importance of, and the widespread good resulting from, the tempered socialism of English factory legislation, I am convinced that the sooner the welding of the four Acts takes place, the better it will be for manufacturers, artizans, and lastly for that at present much puzzled body, H.M. Inspectors.”

Consolidation
of Acts.

DANGEROUS MANUFACTURES AND PROCESSES.

In my last report I explained that the Secretary of State had directed me to have a general inquiry made by all H.M. Inspectors of Factories, as to what manufactures or processes are dangerous, with a view to preparing special rules where necessary. These reports have been received, and in consequence two committees have been appointed to make further inquiries, viz. :—

H. J. Tennant, Esq., M.P.;

Thos. Oliver, Esq., M.D., F.R.C.P.;

Miss M. E. Abraham, H.M. Inspector of Factories;

Commander H. P. Smith, R.N., H.M. Inspector of Factories,

to be a committee to make inquiry into the conditions of work, as they affect the safety and health of the operatives, in the following industries and processes :—

India-rubber works;

Paper staining, colouring, and enamelling;

Dry cleaning;

Basic slag works;

Electric generating works;

Sole stitching by American machinery;

Glass polishing;

File cutting;

Flour mills;

Lithographic works (so far as regards the processes of bronzing and the use of metallo-chrome powder):

Licking of labels for reels, in thread mills;

Galvanized iron works;

Bottling of aerated waters;

Testing of bottles by compressed air;

and into the conditions, as regards safety and health, of—

The use of steam locomotives in factories;

The use of converters in metal works ;
 The use of inflammable paints in shipbuilding yards, &c.,
 and into the manufacture of grindstones and emery wheels,
 as affecting the safety of the persons by whom they are
 used ;

and to report what, if any, special rules should be made or special requirements enforced under section 8 of the Factory and Workshop Act, 1891, and section 28 of the Factory and Workshops Act, 1895, for the protection of the persons employed in these industries and processes.

Lieut.-Col. W. O. Meade King, H.M. Superintending Inspector of Factories;

B. A. Whitelegge, Esq., M.D., Medical Officer to the County Council of the West Riding of Yorkshire :

Jonas Whitley, Esq.;

Edward Hatton, Esq. ; and

W. A. Beaumont, Esq., H.M. Inspector of Factories,

to be a committee to make inquiry into, and report on, the conditions of work, as they affect the health of the operatives, in the industries in which anthrax is alleged to occur, viz., wool-sorting, hairsorting, brushmaking, bone factories, fellmongers' works, furriers' works, tanneries ; and also in the following kindred industries :—

Woolcombing ;

Blanket stoving and tentering ;

Warp dressing ;

Carbonising and grinding, &c. of rags ;

Flock making ;

Feather cleaning ;

Dyeing with arseniate of soda ;

and to report what, if any, special rules should be made, or special requirements enforced under section 8 of the Factory and Workshops Act, 1891, and section 28 of the Factory and Workshops Act, 1895, for the protection of persons employed in those industries.

Aanthrax. The "woolsorters disease" has received special attention, as will be seen by H.M. Chief Inspector's report for 1880. Mr. Redgrave observed :—

"Foreign wools and hair are imported in tightly bound bales, and the first operation on opening the bales is to sort the material into qualities to be dealt with afterwards in various processes of manufacture.

"In the act of sorting, the material is taken from the bales in small bundles, or sometimes fleeces, it is shaken over a sieve or grating on a table."

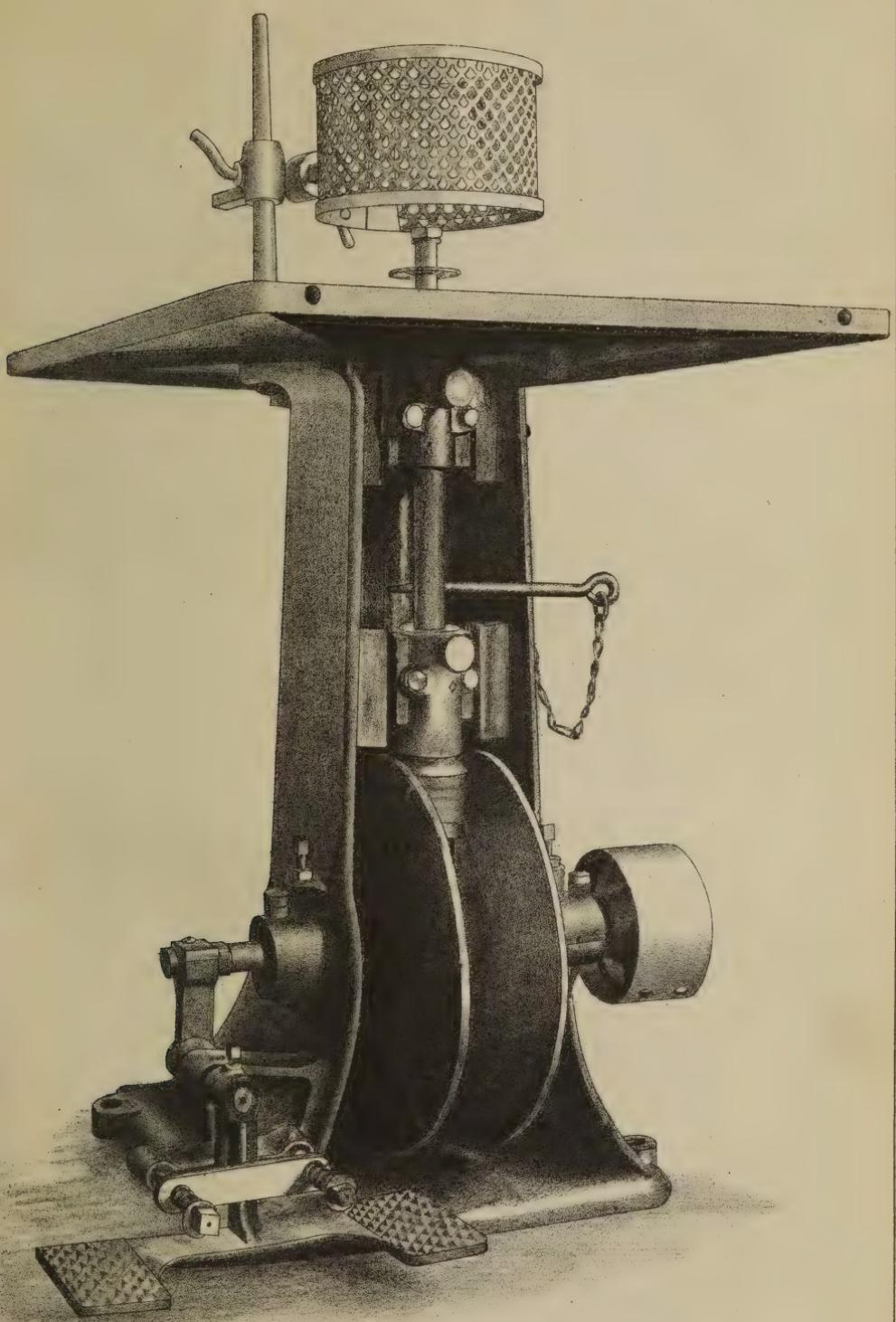
The classes of foreign wool and hair, to some of which have been traced fatal cases, are :—

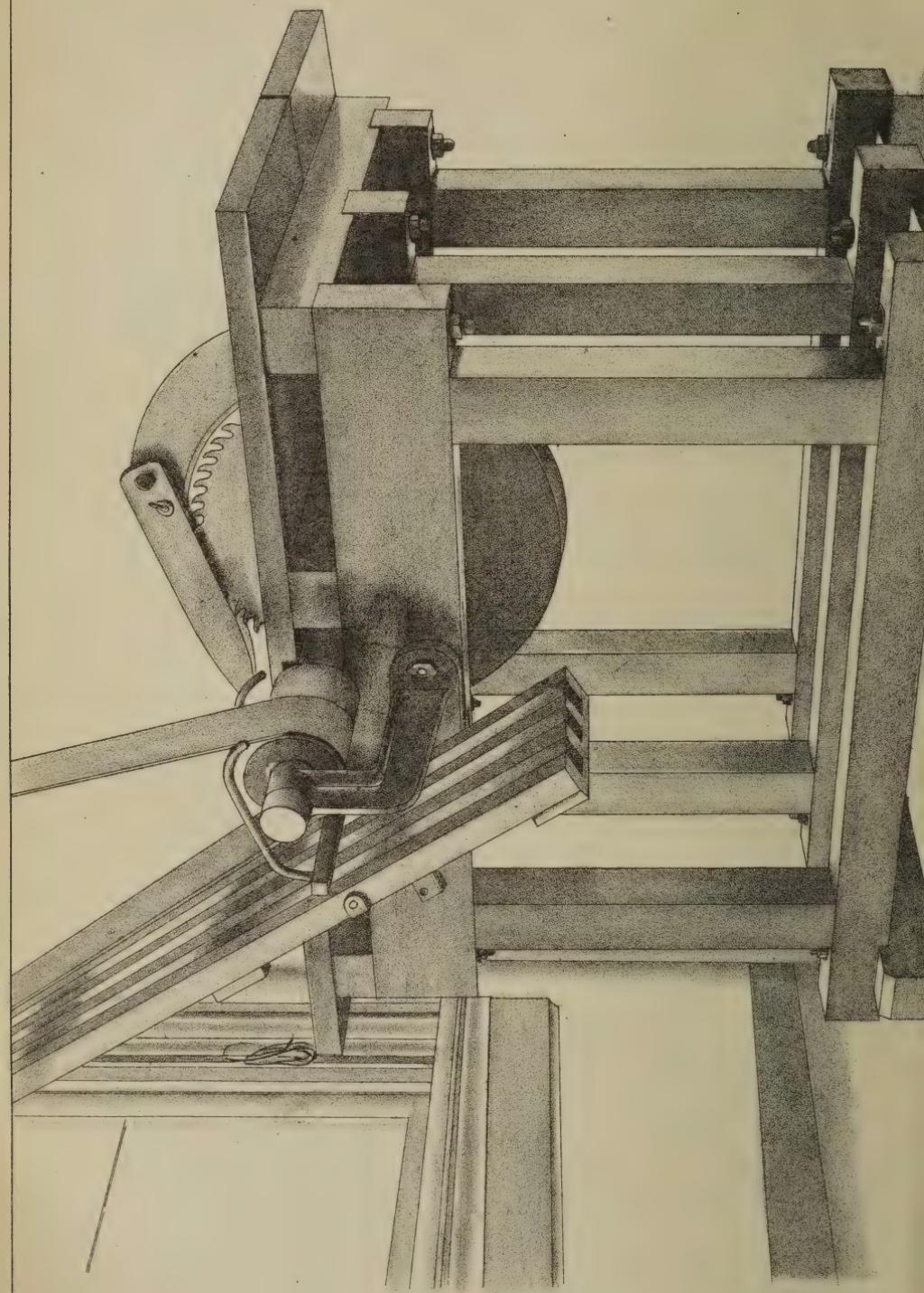
Van mohair ;

Persian wool ;

Camel hair ;

Mohair locks ;





Cape hair of low quality ;

Siberian and South American horse manes and tails ; and

Any damaged imported wool or hair.

Representatives of the employers and woolsorters met in Bradford to decide on what precautions should be taken, and they agreed upon the following regulations, which were drawn up with the concurrence of the sanitary authorities, to be observed in all factories in which what are called "noxious wools" are dealt with.

"BOROUGH OF BRADFORD.

"*Woolsorter's Disease.*

"1st. That all van mohair, camel's hair, and Persian wool, mohair locks, and all damaged wools are noxious, and must be dealt with before sorting. If a sorter considers any wool damaged, he is to call for the decision of the foreman.

"2nd. That all average mohair, cape hair, peleton, and alpaca are to be sorted as usual (damaged excepted).

"3rd. That in dealing with 'noxious wools' before a bale is opened, it shall be steeped in water for a sufficient period, to saturate it. In case the covering does not freely admit the water, it shall be opened so as to do so. In the event of any difference of opinion as to saturation being complete, the sorter may call for the decision of the foreman.

"4th. That after the bale has been in the water the necessary time, the hair or wool shall be placed in a sud of hot water and washed, then passed through rollers, partly dried, and sorted while still damp, as early as possible after washing. The heat of the water to be 100 to 120 degrees.

"5th. That sorting-rooms shall be well ventilated; the floors swept daily, the walls and ceilings swept once in three months, and thoroughly cleansed; and the walls limewashed with lime mixed with carbolic acid once in 12 months.

"6th. That no bale wool shall be stored in the sorting room, save under special arrangement as to ventilation and cubical open area, and no wool, hair, or other material shall be kept in the said room so as to interfere with the proper ventilation thereof.

"7th. That no meals shall be taken in the sorting room, or food kept there. Also, that provision be made for the sorters to wash in or near to the sorting-room."

Mr. Redgrave observes :—

"There is, however, one precaution not alluded to in the regulations which I consider of very great value, and that it is so considered by others is shown by the fact that I found it in operation in many of the factories in Bradford. I mean the erection of a fan connected by troughs with the gratings over which the sorters separate the wool, which carries off nearly all the dust that is shaken from the wool.

"Whatever voluntary precautions are taken by steeping or other analogous process I am of opinion that the sorting boards of all wool or hair should be over troughs or funnels connected with a fan, so as to draw off the dust which would otherwise cover the sorters.

"The Bradford Committee of Employers and Employed expressed the wish that it might be possible for H.M. Inspector of Factories to take the regulations in hand and enforce the observances of them.

"This, however, the provisions of the Factory Act, 1878, did not authorise; but the Act of 1891 meets the difficulty and doubtless the inquiries of the Dangerous Trades Committee will lead to the adoption of special rules."

"Disease and death in a horse-hair factory in Glasgow was described in the report of Dr. J. B. Russell, Medical Officer of Health for Glasgow, 11th September 1879, and published in the 8th annual report of the Local Government Board, Parliamentary Papers, 1879, C. 2452."

Miss Anderson, H.M. Inspector of Factories, to whom I am indebted for German translations, informs me that:—

"Twenty cases of anthrax are reported as occurring in Germany in 1894-95, and of these six occurred in Cassel and five in Middle Franconia alone. Five of the cases were fatal (two in Cassel). Ten cases occurred in horse-hair spinning works and seven in brush works. One case in a horse-hair spinning works at Cassel occurred in the boiler-house, the man in charge being attacked by an anthrax carbuncle in the face. Still more important was the report from Cassel in the previous year, 1893-94, where two women died out of four attacked by anthrax in a horse-hair works. The inquiry showed that the police regulations for the protection of the workers had been observed and that in three out of the four cases the women had been employed in cleaning the rooms. The inspector then recommended that before sweeping the rooms a thorough sprinkling with fluid disinfectant should take place (*e.g.*, with a 25 per cent. solution of lysol in water), and that exactly the same protection should be afforded to the women cleaning the rooms, such as special overall clothes and baths for thorough cleansing of the body, as in the case of workers dealing with suspected materials. In the factories where cases of anthrax have occurred during 1895, special bath and dressing rooms and dining rooms have been ordered. 'In most cases illnesses arrive in factories where foreign hair and fleeces are used, and it is clear that the disease may be most effectually dealt with by thorough disinfection at the points of entry into the country.'"

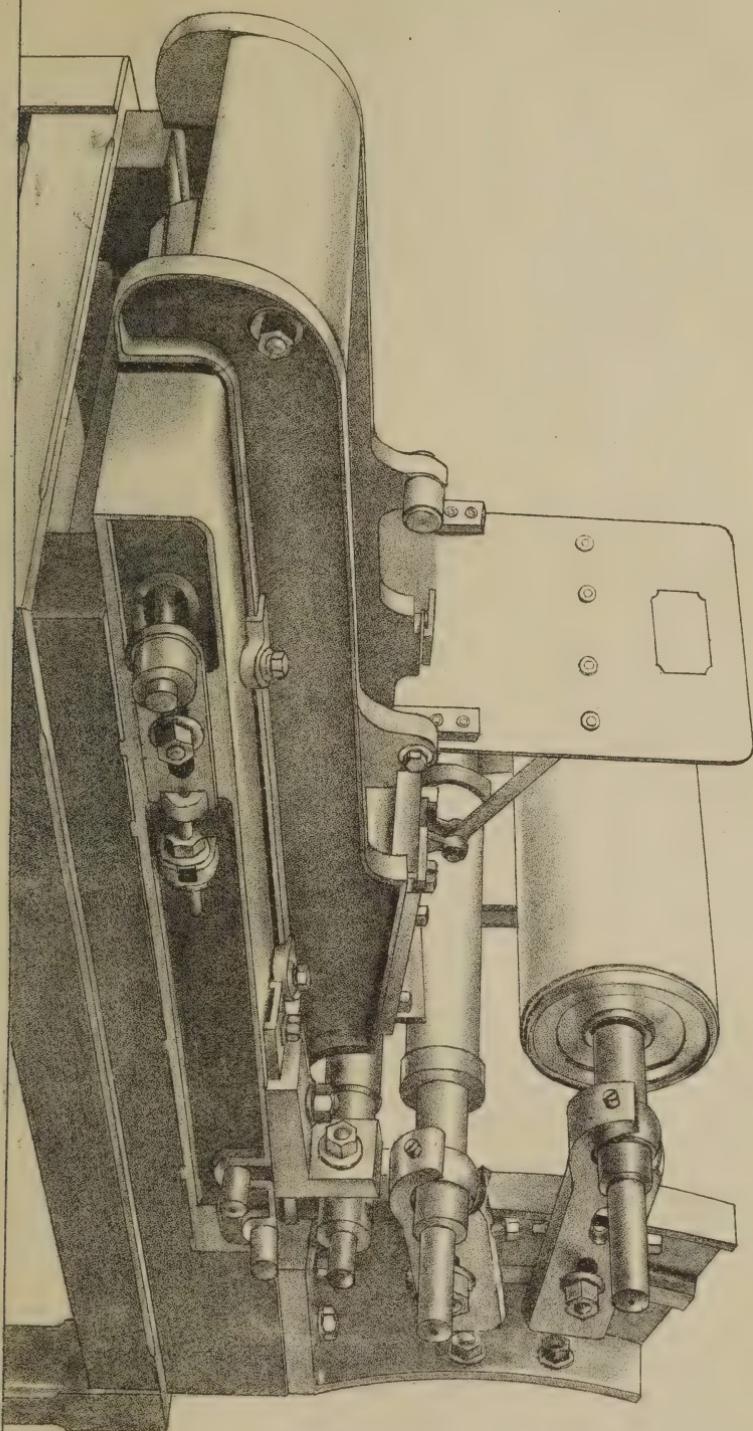
(Official Extracts from Reports of Factory Inspectors, 1895, pp. 351-2.)

Dr. Hamer, Assistant Medical Officer of Health, sent a valuable report to the London County Council, in April 1894, on the occurrence of anthrax in London, published by Edwd. Stanford, 26, Cockspur Street. Price 7d.

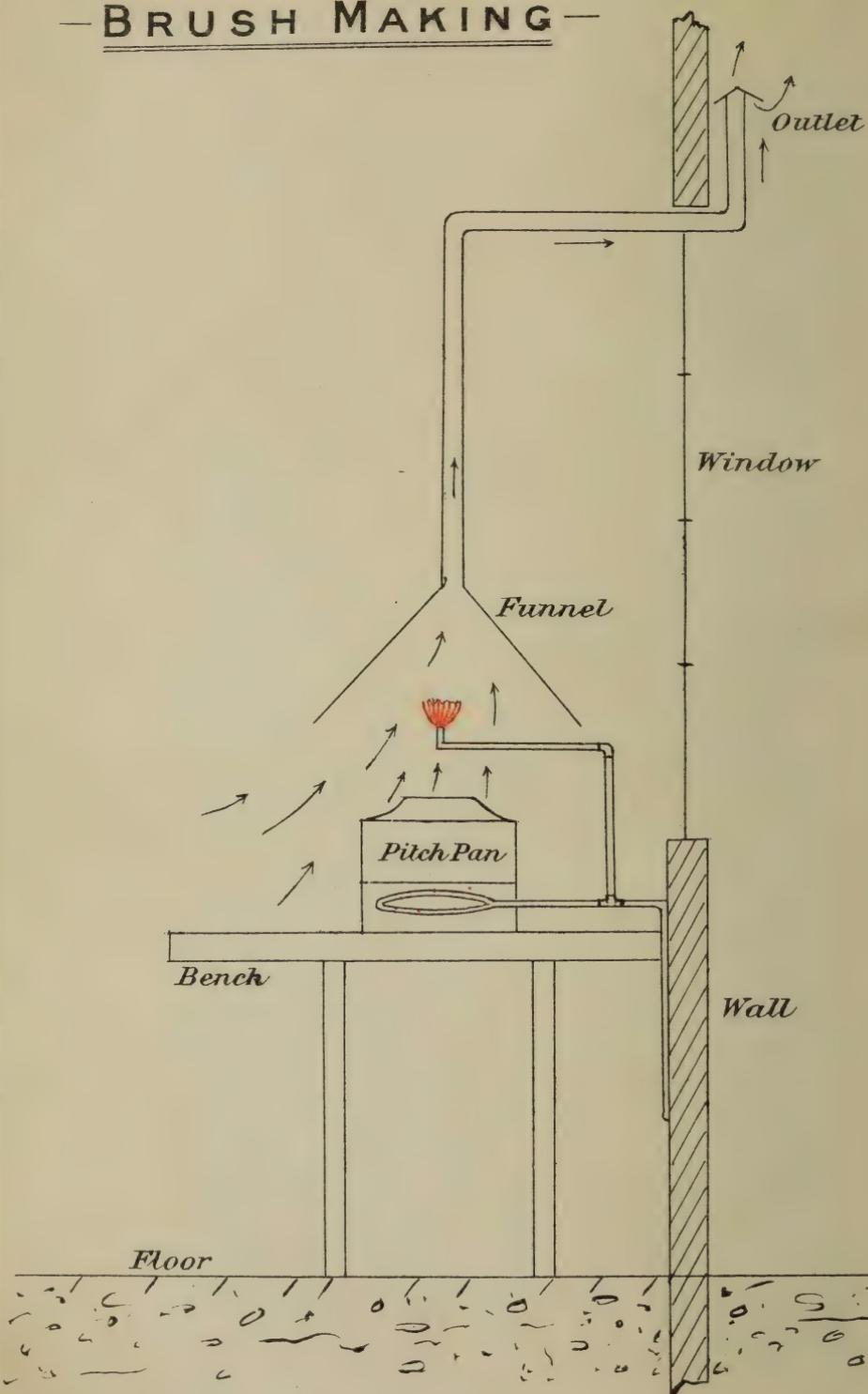
119 cases appear to have been dealt with since 1873. 90 of these cases occurred in persons engaged in the hide and skin trade, and 7 cases occurred in persons engaged in the manipulation of horse hair or the manufacture of brushes.

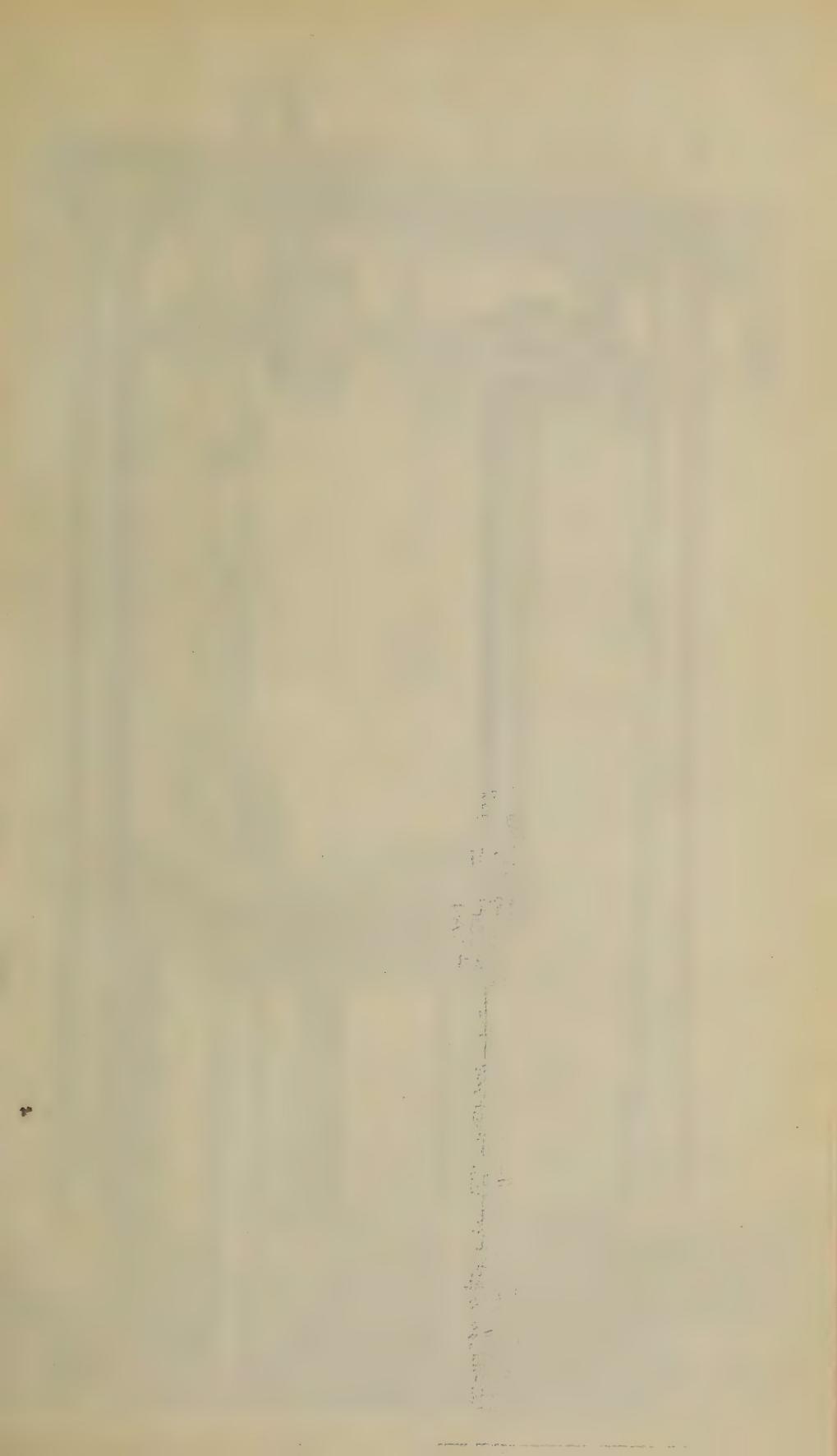
Mr. Crabtree remarks with reference to brush-making:—

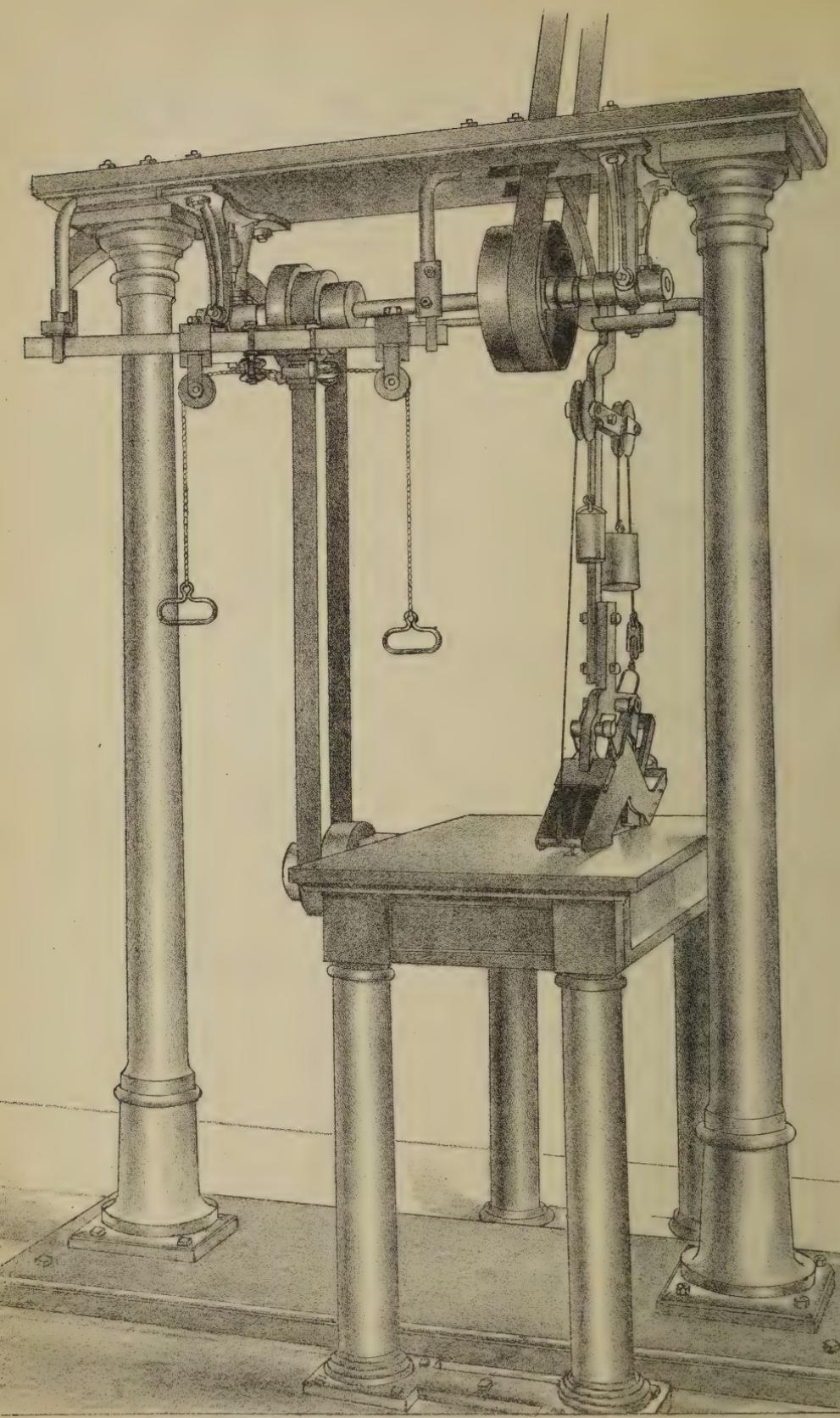
"Though we are unaware of any cases of anthrax in Birmingham resulting from this industry, it is certain that the dust and vapours arising therefrom have been too little controlled by manufacturers, with the result that their workshops have been filled to an unbearable degree with pitch-fumes, bristle-dust, and mineral powder. These pitch-fumes are said to be 'very healthy,' but from the continual coughing which I hear while visiting some of these workshops I am convinced that this incessant irritation of the air-passages must be fraught with pulmonary mischief.



—BRUSH MAKING—







"In some of the better-class shops efforts have been made to modify this state of things. As indicated in the drawing, a wide-mouthed funnel is placed over the cauldron of boiling pitch, this funnel communicating with the exterior by galvanised iron tubes. A gas-jet is placed under the centre of the funnel to ensure a vigorous up draft, which not only conveys the pitch fumes as they are generated, but also bears away the dust from the bristles as they are handled by the workers."

Mr. D. Walmsley, H.M. Inspector, Stockport, remarks :—

"Fur-blowing."—‘Fur-blowing’ in the hatting trade consists in passing the rabbits’ fur through several machines, which take out all the dirt, hairs, and other foreign matter. In these processes the fur is operated on with ‘beaters,’ which cause the fur to fly about in a series of cages enclosed by perforated zinc, the heavy dirt and hair falls to the bottom of the machine, whilst the light dust comes through the zinc openings and fills the rooms.

"In my opinion this work is not healthy, all factories are not provided with fans, and in no case is any provision made for preventing the dust from circulating amongst the operatives.

"The Yorkshire Textile Workers Federation complain that the following occupations are dangerous to health for the reasons stated :—

"Carbonising of rags."—Softening of gums, teeth drop out, general debility, chest and bronchial complaints.

"Wool sorting."—Wool sorters’ disease (anthrax).

"Wool combing."—Excessive heat; fans required.

"Blanket stoving and tentering."—Brimstone used produces sickness, loss of appetite, and affects the chest.

"Warp-dressing."—French chalk, &c., used cause disease.

"Rags."—The same Federation is of opinion that rag-grinding is an un- Rags. healthy occupation, and that all rags from abroad should be disinfected."

In the debate in the House of Commons on the consolidated Bill, 1878, Mr. Wheelhouse observed :—

"In many cases old rags were collected in large quantities and taken to the mills to be worked up a second time into cloth by means of a machine called the ‘devil.’ From the way in which the materials were treated while being collected, and even also when undergoing that process, if there was one method more likely than another to disseminate fever and all kinds of epidemics through the length and breadth of the land, it was by allowing a process of that description to be carried on without some regulation."

In H.M. Chief Inspector’s report for 1890 Col. Meade King draws attention to the danger of rag sorting, and suggests a remedy, and Dr. Arlidge in his work on dangerous trades, page 405, makes special allusion to rag sorting and tearing.

Mr. Beaumont, H.M. Inspector, Bradford, mentions as a dangerous process the shaking of carbonised rags, which has occasionally led to explosions, and suggests that the washing of such rags before shaking should be made compulsory. He observes :—

"I should wish to point out that the ‘shaking of carbonised rags’ before washing has been the cause of terrible explosions, and in several cases loss of life. It is quite true that now in consequence partly of the difficulty of getting workers at this particular branch of trade, as it

was, and for other reasons, the rags are now all washed before being shaken, after carbonising, but I do think it would be well to avoid any possibility of return to the old system, which was stopped simply by personal intervention and reasons named."

Miss Abraham and Miss Deane remark in their joint report :—

" We beg to draw your attention to the injurious effects attendant upon the employment in the carbonising room of a rag factory. The noxious fumes generated cause the teeth to rot away from the gum, which itself becomes soft and unhealthy, and the roof of the mouth is also attacked. The resident physician at the Whitworth Hospital, Dublin, states that blood poisoning is common among rag sorters, pickers, and cutters; irritating and poisonous dust enters the hand by some accidental scratch or cut and sets up blood poisoning. This would probably be averted if washing conveniences were provided, and washing of the hands insisted upon before meals and leaving work."

Miss Anderson, in her *précis* of German factory laws and their administration, shows that local authorities there have in some cases exacted protective conditions for workers before authorising the process of rag-carbonising. In Minden, e.g., it was required: (1.) That movable screens should be provided in front of the hydrochloric acid stoves; (2.) That workers should be provided with protective mouth sponges or cloths; (3.) That the carbonising drum should be thoroughly purified by an exhaust ventilator; (4.) That dressing and dining rooms, properly warmed, should be provided for the workers. " A special process " is recommended by the Inspector for Aachen, which has been " patented by the inventors, Messrs. Schüll Bros., in Birkesdorf. " The carbonising drum is made, not as formerly, of plate iron, " but of woven wire work, so that the rotation causes the cor- " rosive dust to fall to the ground as fast as the process is com- " pleted; the dust is then drawn off in a groove. The heating " is carried out by means of smooth iron pipes along the walls. " Not only does this method leave the carbonised material free " from poisonous dust for subsequent processes, but it also pre- " vents the explosions which are so frequent in the ordinary " methods."

Miss Anderson observes :—

" *Dry cleaning.*—Year by year the German Factory Inspectors report on dangers in chemical cleaning works. Sometimes benzine fumes find their way through broken panes to the boiler house and there take fire, as for example is reported from Cologne; sometimes the woollen stuffs on being packed into the cleaning drum are set on fire by a neighbouring centrifugal machine, as is reported from Schleswig; sometimes in rubbing the well-dried woollen stuffs which have been cleaned with benzine, currents of electricity are set up, as in a Leyden jar, so that the mere contact with a worker's finger nails is sufficient to set the whole material in a flame. ' If cleansing-benzine (*wasch benzin*), to which ' anti benzin pyrin is added, is replaced by sulphuric acid the stream ' of electricity is stopped, because a separation of stearin acid takes ' place under the action of soluble sulphuret of magnesium. Since ' water is a good conductor of electricity, it is to be recommended that

‘the air of the workrooms should be kept as damp as possible.’”
 (Official extracts from Factory Inspectors’ Reports, 1895, pp. 323–4.)

Mr. Hoare, H.M. Inspector for Norwich, late of Wolverhampton, remarks:—

“I only refer to those trades more immediately connected with my present and late district which are under consideration by departmental committees, as follows :

“*Wool-sorting.*—I do not think fans necessary except for Asiatic wools, but with these both fans and lavatories should be compulsory. Overalls are always used.

“*Bone manure works.*—The dust in these is no doubt excessive, but fans are objected to, as the sheds are open and airy, and fans may keep the dust in a state of agitation.

“*Furriers.*—These tell me that they like to keep the air as still as possible. I think they should only be allowed to sweep the floors after working hours, and the sweeper should wear a covering over mouth and nose when sweeping. Skin pluckers should be compelled to wear a head covering and overalls.

“*Rag grinding.—Flock making.*—A fan should be compulsory in both these trades.”

Mr. Beaumont draws attention to the dangers of “dry ^{Dry cleaning.} cleaning” when naptha and benzoline are used, and considers that it should only be carried on during daylight.

Explosions seem to be of frequent occurrence, and serious injuries caused by burning. It seems probably certain that when vapour from benzine becomes heated and reaches a certain temperature it will inflame without being brought into contact with fire or spark.

The use of “sulphide of carbon” to precipitate grease is said to be very dangerous for similar reasons, two explosions with fatal results having occurred in Mr. Beaumont’s (Bradford) district.

Capt. May reports a severe burning accident which happened to a man on 15th May last, engaged in rinsing a dress in benzine, when it took fire spontaneously, and the man was severely burnt.

Dr. Weber has reported cases of mercurial poisoning with Sole-stitching machines.

“I have just observed” (he says) “some severe cases of mercurial poisoning caused by a sole-stitching machine. Out of 14 men working on these machines, eight were affected, three of them very seriously. The machine has a turn-table, called the ‘horn’ on account of its peculiar form. This horn, which works on a pivot and in a vertical bearing, has a hollow passage or groove, through which the waxed thread is passing. This thread, to be sufficiently pliable, passes over a little gas flame which burns on the bottom of that groove. The gas passes to the burner through an annular recess, arranged on the top of the vertical bearing, and mercury is employed to secure a gas-tight joint between the recess, the horn, and the bearing. Through the heat of the gas-flame the horn gets very hot, and the same heat is also imparted to the bearing and the mercury in it. Large

quantities of mercury evaporate and can be traced to every part of the machine, where they form, with the oil used for lubricating that machine, a sort of salve. The men working on these machines soon lose their appetite and strength, suffering at the same time from excessive salivation and swellings of the gums. Eventually they lose their teeth, and fall into such a state of debility that they have to abandon their work. I am told," says Dr. Weber, "that many hundreds of these machines are working in shoe factories."

Glass
polishing.

Mr. Murray, chairman of the Midland Association of Flint Glass Manufacturers, has drawn attention in the public press to the danger of lead poisoning by inhalation and absorption in the polishing process. He goes on to say :—

"In order to minimise, and, if possible, avoid such danger, we, some three or four years ago, fitted up a special polishing room at these works, so arranged that the lead particles are drawn away from the operator by means of suction, caused by one of Blackman's air propellers working at the end of a closed chamber. This has the effect of absolutely preventing the injurious matter getting near the operator's face, so no danger can take place from inhalation. In addition to this, we avoid, as far as possible, the handling of the lead powder, by arranging an automatic 'feeder.' This feeder does away with the necessity of a boy being employed to 'feed up.' Now feeding up alone is very injurious, because for two or three hours a day the boy has his arm bared to the elbow and is continually dipping into the lead, in order to supply the rotating brush which is doing the polishing. It will readily be seen that it is absolutely certain that some of the lead adheres to the skin and so gets into the system, with, as is well known, dangerous and often fatal results. The proof that our improvements are beneficial is that never since they have been in operation have we had a single cutter ill from lead poisoning, and the men all say that the difference in their general health is remarkable. Feeling that in all trades where deleterious substances are used, similar arrangements could, and, in my opinion, should be made, I have ventured to trespass at this length upon your space. Further, I shall be pleased to show the room and explain the working to anyone interested."

Mr. Hoare remarks :—

"Where fans are not in use, an excellent plan is to carry a box from a bonnet fitted over the brushes into the chimney of the glass house ; the heat in this causes sufficient suction to draw away all dust. Washing appliances should be provided."

"It is no longer usual for hands to be engaged solely in polishing, each cutter polishing his own work."

File cutting on
lead beds.

Dr. Sinclair White, lecturing on the sanitation of industries and occupations, alludes to a special danger, to which hand file cutters are exposed, due to the employment of a lead bed on which the files are cut.

"The teeth of a file" (he says) "are produced by means of a chisel and hammer ; and to afford a firm bed for the file and reduce vibration, a block of lead is placed underneath the file. The non-elastic character of lead eminently fits it for this purpose, while its comparative softness prevents it from injuring the teeth of the file when the reverse side is being cut."

"At each stroke of the hammer a fine cloud of dust, containing much lead, rises in the air, and as the file cutter sits with his face directly over the anvil, he must, perforce, inhale some of the lead dust. Moreover, his left hand, which holds the chisel, is almost always resting on the lead block, from which it receives a coating of lead, and in a great many instances some of this finds its way to his stomach at meal times. Nor is this all, a practice exists among certain file cutters of moistening from time to time the end of the left thumb at the lips, so as to secure a better grip of the chisel. This habit, I am pleased to learn, is dying out, but where it is practised it is a potent method of introducing lead into the body."

Dr. Arlidge calls attention to this danger in similar terms. H.M. Inspectors Capt. Smith, R.N., Messrs. Hoare, Sedgwick, and Dodgson add their testimony to the danger.

Mr. Hoare observes :—

"Washing appliances and acid drink should be provided, and also pieces of resin, the latter to induce the worker to rub his fingers on that rather than lick them, which is a common practice, when they become slippery from holding the tool."

Miss Anderson remarks :—

"India-rubber works."—I have visited several works in the Manchester District where both carbon, bisulphur, and naptha are used, and have talked to female workers during their employment and at home, besides visiting the hospitals and having conferences with the surgeons attached to them, and Medical Officers of Health. I find that even if, as stated, the use of carbon bisulphide has decreased, there are certain processes in which it remains an essential part, e.g., making of air balloons, tobacco pouches, various fancy articles, surgical rubbers, and, in fact, all kinds of articles in which a high degree of elasticity is required. In all these cases I have found women and young girls at work, and in only one case have I found precautions systematically adopted which appear, so far, to have adequately protected them from the otherwise necessarily injurious effects of the fumes to which they are exposed. The mother of one girl, whom I saw in her home, tells me that she 'never expected to see her daughter the same girl again; that she sits down in a stupor or extremely drowsy condition in front of the fire whenever she comes home, refusing food, and that also frequently she can only be got to bed by being carried there, while, if aroused, she gets wild and excited.' All these and other symptoms, e.g., uncertain gait in walking, are effects attributed to poisoning by bisulphide of carbon, in Dr. Bury's Treatise on 'Peripheral Neuritis.'

"India-rubber."—In France, women and persons of both sexes under 18 are excluded from employment in india-rubber works in the processes where noxious fumes, such as sulphuret of carbon and benzine, are given off. In Belgium persons under 16 are similarly excluded by a recent Decree, and, further, female young persons and women from 16 to 21 years may not be employed for more than five hours a day, nor for longer than two and a half hours at a time.

"I have only found one employer who recognised the necessity for strictly limiting the time spent by workers in the bisulphide of carbon room, in addition to adoption of the strongest possible methods of mechanical ventilation. He has been a practical worker at the process

himself, and pointed out to me the risks of insanity attending this occupation."

Mr. Rogers observes :—

" Carbon bisulphide with which is mixed a little chloride of sulphur is used in the finishing process of vulcanising or curing the rubber. In the case of curing waterproof cloth, the cloth is passed through fumes which arise from a trough containing the mixture referred to above. The process is named liquorizing.

" Toy balloons are 'cured' by being dipped into a liquid of the same constituents.

" I found that bisulphide of carbon was used constantly in five factories and one workshop in the Manchester district and in all these places I found evidence of the ill effect on the health of the workers, through the fumes given off from this compound.

" Most of the workers who are much exposed to these fumes complain of violent headaches, dizziness, and nausea, and in some persons a paralysis (peripheral neuritis) is set up. In one of the places I visited I found two workers who had apparently suffered from this disease recently, both had completely lost the use of their limbs for some weeks, and gradually recovered when they were not exposed to the fumes; they had both returned to work and apparently at my visit were qualifying for 'another period of absence.'

" Some firms have erected fans and specially contrived machines to minimise the danger."

Mr. Richmond reports :—

" The solvents used are bisulphide of carbon and naphtha and sometimes chloride of sulphur.

" Bisulphide of carbon is prepared by the direct combination of carbon (charcoal) and sulphur, at a moderate red heat.

" Among its impurities is sulphuretted hydrogen. It is poisonous when taken internally and continuous inhalation of its fumes is very injurious.

" There is no doubt that in the absence of effectual means to carry off the fumes generated in the carbon-sulphide process, injury of a more or less serious nature is sure to result to those exposed to them.

" The use of this process has undoubtedly decreased and much has been done by manufacturers to remove or lessen the injurious effects."

Mr. D. Walmsley observes :—

" India-rubber works are classified as coming under the inquiry of the 'Dangerous Trades Committee.' This was also a subject of special inquiry some time ago by H.M. Inspectors of Factories. At that time it was found that 'bisulphide of carbon' when inhaled by the workers was dangerous to health. I am pleased to say that an enterprising firm inform me that they have found a harmless substitute for bisulphide of carbon, viz., sulphur. This is mixed with the rubber and enters with it in all the processes, until the vulcanising process takes place. By this harmless substitute a great benefit must ensue to the operatives."

The process of bronzing in lithographic works is referred to by some of H.M. Inspectors as attended by injurious consequences to those engaged in it.

Miss Abraham and Miss Deane in their joint report remark :—

" We have made special inquiry into the process and in all cases the women and girls employed seem to suffer more or less from the effects of bronze dust. Severe headache, diarrhoea, vomiting, colic, eruption

of the face and hands, anaemia, cough, and catarrhal affections were the more serious results to which our attention was drawn. One girl was attended at Guy's Hospital for bronze poisoning.

"Bronze powders vary slightly in their composition, but all contain ingredients of a poisonous or injurious nature.

"They had seven different sorts of bronze powder submitted for analysis and they were found to contain copper, zinc, aluminium, silica, and metallic zinc (brass) and the green bronze contained an aniline dye."

Messrs. ——, recognising the danger of the employment, endeavour to meet it by placing the bronzers under the charge of a medical man, and by enforcing the use of respirators."

Miss Anderson remarks:—

"I have seen girls at the work with their lips and faces coated and hair powdered with bronze.

"The use of simple muslin respirators, overalls, and head coverings, and mechanical ventilation appears to me highly desirable.

"The more careful employers supply milk to workers who have been kept at bronzing for more than a few hours at a time.

"In France employment of persons under 16 at bronzing by machine is prohibited as it is in bronzing in tinfoil works. (Decree of May 13, 1893 Schedule C.)"

Mr. Newlands remarks:—

"In the majority of works in the Manchester district bronzing machines are used, while in others the bronzing is simply done by means of a 'hares foot' duster. The latter method is being rapidly superseded either by the introduction of the machines before mentioned or by the use of a box-like hood with perforated bottom fitted with valves which are worked by hand. In either of the last mentioned methods the dust thrown off into the atmosphere of the factory is nearly a minimum, whereas in places where I find hand bronzing done to any great extent the whole of the room, before many hours, assumes the colour of the dust used.

"In such cases I have invariably recommended the use of respirators and milk as a drink.

"The effects on the system, if taken in quantities such as might be expected in the case of any person breathing a bronze-laden atmosphere for any length of time, are severe diarrhoea, vomiting and violent nausea."

At an inquest on a girl who had been employed illuminating tin plate boxes, Dr. Bartlett, F.C.S., &c., stated that he had seen some bronze that is mainly composed of copper which he considered greatly injurious to health, and red bronze containing sulphide of mercury which is dangerous, although he did not know any case of absolute poison from it. He analysed two bronzes (gold and silver) and found sulphate of tin, metallic copper and small quantities of antimony. He said that he had known many serious and often fatal cases in lithographic establishments where greens were dusted.

Miss Abraham and Miss Deane made special inquiries as to Lithographic
the use of metallocrome, and obtained analysis, from which it works.
appeared that it contained a large proportion of white lead, and Metallo-
the women employed complained of the injurious effect upon their chrome.
health, even when only so employed for a short time.

Lithographic works.
Emerald green.

Miss Anderson draws attention to the regulation by special decree in France (*Décret du 29 Juin 1895*) of the conditions of manufacture of emerald green, aceto-arsenite of copper, and suggests that some of the special rules might be usefully adopted in processes involving application of this product. The two most important rules appear to be:—*Article 5.*—Employers and managers are bound to supply workers employed in the various processes with masks, moistened sponges, or other means of protecting the respiratory organs, also with canvas working-gloves for protection of the hands. Gloves, sponges, and masks to be frequently washed.

They must provide, further, French chalk (*poudre de talc*), so that workers may sprinkle their hands and other parts of their body apt to absorb dust.

Article 6.—Employers and managers must supply workers with overalls, to be worn only at work, capable of being closed at the neck and wrists. They shall see that these garments are frequently washed.

Mr. Hoare observes:—

Bronzing, &c.

“*Bronzing, &c.*—In well regulated works where much of this work is done, a brushing box is, or ought to be, provided. Where only an occasional job of such work is done this is not necessary, but in all cases I consider washing appliances should be provided.”

Electric generating works.

Mr. Wright drew attention to the necessity of making special rules for electric generating and transforming stations, where the electricity is employed at high pressure.

Mr. Hoare remarks:—

“In such works all the dangerous parts should be so marked and covered with glass cases, no metal bars or pillars should be uncovered, india-rubber mats, or floors standing on insulators, should be provided, and where india-rubber gloves are necessary they should be examined daily by a competent person.”

Mr. D. Walmsley remarks:—

“Electricity as a motive power in factories is still in its infancy. It is conjectured that in time shafting and belts will be a thing of the past in our cotton and other factories, and that each machine will be driven direct by the aid of electric motors.

“This, from an economic point of view, will be of advantage, as the loaded gearing is computed to take 50 per cent. of the power in transmitting it to the machinery.

“Messrs. Ashton Bros. and Co., Ltd., of Hyde, successfully drove a few cotton frames by the aid of small motors this year, and will probably be ready to extend this driving as soon as science has progressed in this matter to meet the wants of progressive manufacturers.

“During the last 12 months Messrs. Joseph Adamson and Co. have been initiating a new departure in their own works with the idea of shortly working also for the open market. This is the development of electrical transmission of power in place of the mechanical methods now in use in engineers' shops and elsewhere.

“This firm have at work at present three high-speed five-ton cranes and one 10-ton crane, all overhead travellers, and have nearly completed a similar one to lift and travel with a load of 30 tons. They have also

working two lifts in their rivetting tower, driven by independent motors, one small drilling machine driven in a similar manner, and one large boiler-shell drill, carrying 11 drills, driven by a reversible, variable speed motor.

"As examples of the universal adaptability of this method there may be mentioned, in addition to above examples, also the driving of a Green's fuel economiser, and fans for smiths' fires, &c., which the firm have at work.

"The most apparent advantages of this system, which will become more decided as it is further developed in these works, is the absence of belting and shafting, with their attendant dangers, owing to straps flying off and requiring putting on again, and the necessity for constant attention to see all the bearings are kept properly lubricated.

"In the case of hoists, the greater safety is very apparent, as there are no straps to get worked out and break under load, and having electricity at hand it is an easy matter to devise the simplest possible automatic brake, which in the case of any accident to the hoisting mechanism shall effectually sustain the load.

"In the case of overhead travelling cranes there are no unsightly and dangerous revolving square shafts or flying ropes, and all the motions are easily controlled from the floor by the man in charge of the lifting operations, and thus misunderstanding of signals and consequent accidents are entirely obviated."

Mr. R. Johnson observes :—

"I am pleased to inform you that the large wire factory noted last year, in which all the machinery is driven by electricity, thus dispensing with gearing, is working satisfactorily."

Mr. Lewis reports :—

"Electricity for lighting and as a motive power is becoming general throughout the district, and many generating stations have been erected by private firms and local authorities since the date of my last report."

In reporting on an accident through the breaking of a Grindstones. grindstone, whereby a man's skull was fractured, the certifying surgeon remarks :—

"It seems a pity that no practical test of a grindstone, as to whether it contains a crack or flaw, seems to be adopted. It is stated that the quarrymen know in working the stone when it is unsound, but that, as no compensation is allowed for bad stones, they are sent out as if they were good."

Whether grindstones and emery wheels can be subjected to a reasonable test will be for the consideration of the committee.

Mr. Lewis, H.M. Inspector for Wales, observes :—

Converters in metal works.

"I think that users of converters in metal works should be compelled to fit them with automatic safeguards to prevent accidents caused by the fracture or breakage of hydraulic mains or by variation in the supply of hydraulic power."

Mr. Whymper has drawn attention to the accidents arising from "converters" in steel works, which Mr. Lewis explains as follows :—

"The converter is a pear-shaped iron vessel of from 15 to 20 feet in height, mounted on an axis in its centre, and with an open mouth at its apex.

" Its function is to receive the ' charge ' of molten pig-iron (averaging from 5 to 10 tons), which has to be converted into steel, and to pour it into an immense ladle placed, in a pit immediately below and in front of the converter.

" To do this the converter has to be inclined slowly on its axis downwards, and with its mouth in the direction of the ladle by means of hydraulic pressure. It is at this stage of the process that accidents are liable to happen. From some unknown cause the hydraulic pressure at times partially fails, with the result that the gentle progressive inclination of the converter receives a sudden tilt, and its contents are violently spilt in all directions, to the injury more or less serious of the workmen, who are standing in the pit below, prepared to assist in the operation.

" Means for the prevention of such accidents have been adopted by some firms."

Steam
locomotives in
factories.

The late Mr. Whymper observed :—

" While turning back to my memoranda, I find among the mention of accidents which were then comparatively frequent, but have now become much more rare. These are those which I then called ' run-over ' accidents. They occurred in the great iron and steel works. In one such place in South Wales several persons were, within a short space of time, killed by trucks running on the rails, which over a straitened space and often down steep declines, intersected the works in all directions. Some of these accidents were caused by trains running loose, others by trucks which were being backed without anybody being placed on the look-out in the truck, which from being the last in order, had now become the front one. The issue by the management, soon after the whole matter had been investigated, of a code of rules enacting among other things that there should always be a look-out man in the leading truck, almost immediately caused, or at all events was followed by, a decrease in the number of these accidents. For not only did the rules have their effect upon the drivers of trains, but they also strengthened the hands of the inspector, to whom they afforded a basis for cross-examining those in charge if any accident occurred. I am glad to say that this comparative immunity has continued. I have made particular mention of these accidents because of their severity (they were as often as not fatal), of their frequency at that time, and because they were, as I thought, largely preventible."

Special rules have been drawn up by various firms to prevent such accidents, and the Committee on Dangerous Trades will inquire how far such rules should be made obligatory on firms who have neglected to adopt them

Mr. Hilditch observes :—

" Locomotives in works are a continual source of danger, and are responsible for a large percentage of the accidents.

" H.M. Inspector, Mr. Lewis, has succeeded in getting most of the large industries in the district to adopt a code of rules for their loco-traffic. If special rules framed somewhat on the lines of the above rules were put in force, I believe the number of accidents would be materially reduced."

Miss Anderson observes :—

Labelling reels
in sewing

" *Sewing Cotton Factories where Reels are labelled or ticketed.*—I have visited several large sewing-thread factories, and in all save

one, the labelling of reels is done by numbers of young girls who are continually, or for considerable spells, engaged in licking and sticking factories on the labels by hand.

"Even where the labels have been very carefully prepared with pure gum or adhesive mixture, and I believe that this is generally the case, the continual loss of saliva and consequent abnormal activity of the glands must have an injurious effect upon the health of these young girls. In a considerable number of cases, however, the girls said that the gum did not always taste good, and was apt to make them feel sick at times. I found several cases, at one of the largest factories, of girls suffering from time to time from swollen glands in the neck; those I questioned, said they had not suffered in this way before coming to the factory.

"The one factory where I found that the above-indicated method had been entirely discarded is Messrs. Strutts at Belper.

"There an ingenious and simple hand machine has been invented, which is giving complete satisfaction both to workers and the firm.

"Even the use of a moist sponge or piece of felt would seem to be a perfectly simple and efficient substitute for the tongue. More than one manager, however, asserted that the girls could work more quickly and surely by the more elementary method; that they disliked experiments which lessened their rate of working, and consequently their earnings, as they are paid by the gross. This was not entirely confirmed by statements made to me by the girls, and the remark of one manager that labels were apt to come off when a moist sponge was used, a result highly disadvantageous for the manufacturer, appears to afford the real explanation of the existing practice."

Mr. Platt remarks with reference to—

"Licking of labels in thread factories."—In the only thread factory in my district troughs are provided, but rarely used. The girls are paid by piece and can do the work much quicker by licking. If there is any green in the label dipping is insisted on.

"Occasionally a girl complains of loss of appetite, which is attributed to this licking of labels. 'Pure gum only is used.'"

Mr. Hoare remarks:—

"Paper Staining and Enamelling."—In this trade proper washing convenience should be provided, overalls should be insisted upon in the bronze grinding room, and brushing boxes for removing the superfluous dust.

"In the colouring of paper, if any poisonous colour is used, such as arsenical green, there should be a limit of the quantity of work that a worker may do in one spell of say two reams, and no worker should be allowed to work except with arms bare to elbow, and free from cuts or scratches; the workers should use overalls, and these should be washed on the premises."

Attention has been drawn by one of the trades unions to the inflammable great danger arising from the use of inflammable paint, they paints. observe—

"These workmen are painters' labourers, sometimes called red leaders, and are employed about dry docks and ship-repairing establishments generally, and do the rough scraping and painting and cleaning up work on vessels that come in for repairs.

"Of late there has been introduced a particularly dangerous nature of composition of a very gaseous and inflammable character which is

injurious and unhealthy to the workmen, especially when applied in closed spaces where the air has not free access.

"It is quite a common occurrence for men to lose consciousness while applying this composition in confined places, and this necessitates their being brought into the fresh air and restoratives being administered to them.

"The composition also makes the eyes run and leaves them very weak.

"Most of the ship-repairing employers as well as the workmen are anxious that the use of this composition should be discontinued, but the ship owners insist on its use."

**Galvanised
iron works.**

Mr. Richmond draws attention to the injurious effects of this manufacture, observing that the teeth of the men are much affected, salts of muriate are used as a flux at the galvanising pots and hydrochloric acid in the pickling tanks.

Mr. Hoare remarks :—

"A great deal in this trade depends on the construction of the bath, the old plan of filling in the cokes from the top causes the workers to feel the effect of sulphur fumes, I see no reason why the other plan of firing from below should not be general. With the large baths a hopper seems undesirable, as many workers prefer not to have one, as they complain it throws the heat back on them; they say it is better to have a lofty room with a lufra roof and moveable shutters in the side walls.

"With the small baths I think good ventilation and a hopper are desirable, heat causing the fumes to pass up the hopper."

**Aerated water
bottles and
testing of
bottles by
compressed
air.**

Mr. Whymper in one of his reports refers to the frequent loss of eyes or laceration of members from the bursting of aerated water bottles, the accidents being caused by the weakness of, or a flaw in, a bottle, or overpressure when it is being "charged," i.e., filled with gas. He remarks that if only the custom of wearing proper guards was adopted, many, probably most, of the explosions would be rendered harmless.

Captain Smith, R.N., drew attention to an accident whereby a young woman lost her eye in testing bottles by compressed air, a bottle burst and she was struck by the broken glass. Gloves to protect the arms and hands had been provided, and a wire gauze screen supplied to each worker, and it was owing to her neglect in not using the screen that the accident happened.

Captain Smith remarks that although masks are generally provided those employed neglect to wear them, and it is wisely provided by section 9 of the Act of 1891 that if special rules are made and any person neglects to comply he shall be liable to a penalty.

**Arseniate
of soda.**

Mr. Pearson, H.M. Inspector, Rochdale remarks with reference to a complaint he received :—

"Several females were taken ill and I traced the cause to some 'opal blue' yarn which they were winding."

"The manager admitted that the yarn contained arseniate of soda and this particular lot had been mismanaged in dyeing by being hurried through the process, and the arseniate of soda not properly fixed on the fibre."

Mr. Richmond, H.M. Inspector for Liverpool, reports :—

“ *Lucifer Match Works.*—Several matters of interest in connection Lucifer match with ‘dangerous trades’ and ‘special rules’ have occurred in this district works during the past year. In December 1894 a case of necrosis was reported to me from lucifer match works. I visited the Stanley Hospital and saw the girl. An operation had been performed removing a large portion of the jaw, and the patient was on the high road to recovery. The girl had been employed in the boxing department which was well ventilated by means of two fans. The girl acknowledged to me that when she first felt what she called ‘tooth-ache’ she had concealed the fact lest she should lose her work. This was a case which would presumably have been discovered earlier under the periodical examination of the hands by the certifying surgeon recommended by the Lucifer Match Committee in their proposed Rule 6, but which is at present in suspension.

“ I was recently requested by the manager of the Diamond Match Company, an American company owning 12 factories in America, to go over the new factory which is in course of erection at Litherland, near Liverpool.

“ The special rules for lucifer match works were drawn up to suit the processes as carried on in England heretofore, and I scarcely see how many of the rules will apply to these new works, where the process will be entirely different. The manufacturing department will be on the fourth floor, at the top of the building, and the matches will be made entirely by machinery. A block of wood is put in at one end of the machinery, and is then cut into matchwood, dipped, dried, and delivered at the other end in boxes at the end of one and a half to two hours. Nothing then remains but to put the covers on the boxes. The matches are never handled at all, and I am informed that necrosis is unknown in the company’s factories in America.

“ The rooms will all be warmed by hot air and lighted by electric light, whilst by a mechanical contrivance, in the control of a special attendant, the air can be entirely changed in any room in a very short space of time.

“ *Chemical Works.*—In January of this year a death occurred in a Chemical works at St. Helen’s, through the deceased man being ‘gassed’, whilst cleaning the sulphate of lead out of a vitriol chamber. After long use a vitriol chamber, which is entirely lined with lead, has to be renewed owing to the action of the acid on the lead. The chamber in question was 130 feet long, 25 feet in width, and 20 feet in depth. In such cases it is the custom to cut holes in the sides, and open apertures in the roof to allow of the escape of any gas, and to let it stand so for sometime before the men enter the chamber to clean out the sulphate of lead which has collected on the floor. This sulphate of lead, however, contains more or less nitrous fumes, which affect the men powerfully when it is stirred during removal. The deceased on entering put on a very imperfect respirator in the form of one fold of dry rag. Patent respirators were supplied by the United Alkali Company but the men prefer their own ‘muzzles’. After working for half an hour the deceased was obliged to leave work and go home, where he died from the effects of the gas. In many works it is the custom to thoroughly wash the sulphate of lead with a hose and rake it over from the outside before the men are allowed to enter, and the death of the man was no doubt due to the neglect of this precaution. In accordance with my recommendation the United Alkali Company have sent round a communication to all their managers, requiring that this precaution be invariably taken in future. It would be well if a rule to that effect could be added to the special rules for chemical works.

Artificial
manure works.

"Artificial Manure Works."—In January last a case of death from anthrax occurred at artificial manure works.

"I visited the works and made inquiries into the materials used. All those which were at all likely to produce anthrax were tested by Dr. Robertson, medical officer of health for St. Helen's. No results whatever were obtained from the wool waste and dried blood, but any number of bacilli resembling those of anthrax resulted from experiments made with the dried bones imported from India.

"Dr. Robertson recommended the free use of carbolic acid for washing purposes at such works."

White lead
works.

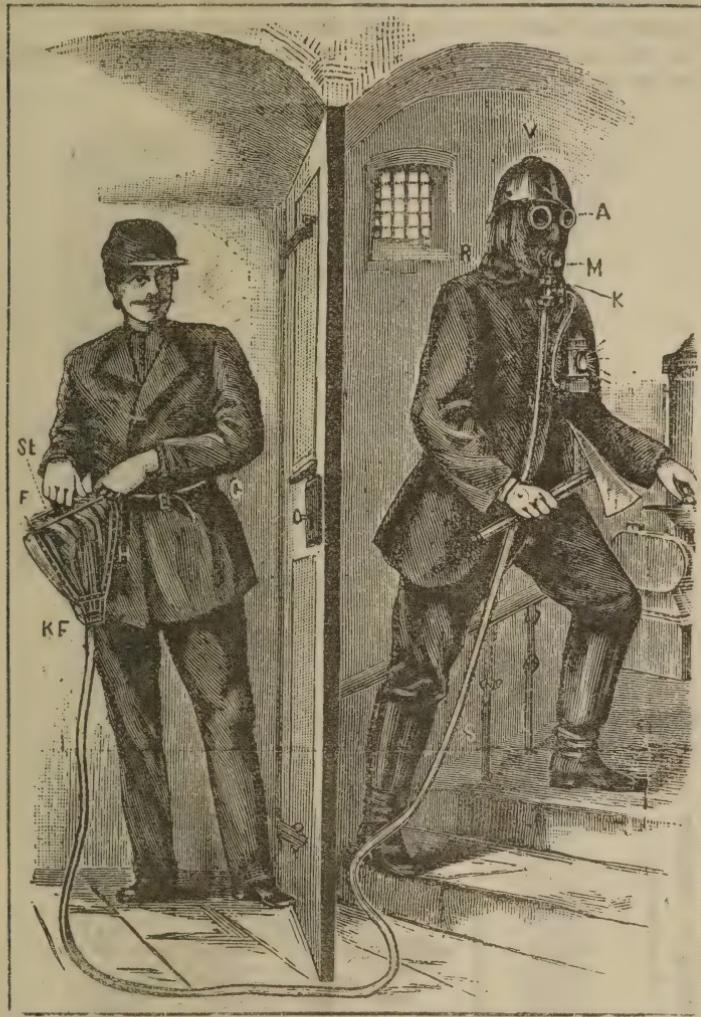
"White Lead Works."—On June 12th I attended an inquest at Chester on a woman who died from lead poisoning. The jury returned a verdict to the effect that 'the deceased died from lead poisoning contracted at the lead works in consequence of the neglect of the special rules by the management.' As a result the company were proceeded against for, (1) not reporting cases of sickness from lead poisoning with regard to Bridget Rogers and Kendrick Bowker, and (2) for neglect of the special rule as to weekly baths.

"I enclose account of the trial, from which it will be seen that, whilst convictions were obtained in the case of Kendrick Bowker and as regards the neglect as to baths, the Bench dismissed the case, *re* Bridget Rodgers, concerning whose illness no notice was sent by the firm, to the Inspector or certifying surgeon, either before or after her death, stating that 'they could not believe that the rule was intended to apply to persons after death.'

"Since the case was heard I have visited the works again and found that the rule as to baths is now very efficiently observed. Each man or woman, before receiving his or her weekly wages is required to produce a leaden token from the bath attendant, showing that he or she has taken a bath that week. On a recent visit, however, I found two men at work in the dry stove without respirators on, although they were hanging round their necks. I called the two offenders before the manager and offered them the choice between being summoned by me, or fined 2s. 6d. each by the manager. They chose the latter, and were warned that a second offence would mean instant dismissal.

"Rescue Respirators."—Since writing the above remarks on dangerous trades and special rules, I have been visiting some of the chemical works at St. Helen's, and am glad to find that the United Alkali Company have now provided the form of rescue respirator which I have all along advocated, under No. 9 of the special rules for chemical works. This was recently, I understand, tested at one of the St. Helen's works by the chemist and the manager. Two taps of sulphuretted hydrogen were opened in the carbonating house, with the result that the former, who had no respirator, was forced to beat a hasty retreat, whilst the manager, wearing the rescue respirator, remained inside for 10 minutes without feeling any effects. This respirator is similar in form to one which was shown to the chemical committee at Alhusen's works, Newcastle-on-Tyne. It consists of a helmet, the upper part being made of leather, fitted with glasses for the eyes and a cylinder, filled with charcoal, to breathe through; the charcoal when in use being saturated with a solution of caustic soda. The helmet, which is quite light, fits right over the head, and has fixed inside a rubber tyre, which can be inflated with air, and which fits over the mouth and nostrils. At the works in question the respirator is kept in the laboratory, near the carbonating house, and should, I think, be kept ready for use at all works subject to escapes of sulphuretted hydrogen and other deadly gases, as a means of rescuing anyone overcome by the fumes."

II. Description of and directions for handling
KLEEMANN'S PATENT SAFETY RESPIRATOR of TOLCH & Co., Engineers,
 St. Peter's House, 146, Clerkenwell Road, London.



The respirator a. p. illustration consists of three principal parts:—

1. The helmet with valve (V), eye glasses (A), mouthpiece (M) joint (K) for affixing air tube, strap (R) for tightly buckling the soft neck leather; total weight $2\frac{1}{5}$ lbs.
2. The double-acting bellows, weighing 7 lbs.
3. The india-rubber and canvass non-collapsible air tube.

A girdle (G) is sent along with each apparatus.

When using the apparatus one man puts first the girdle on, hooks the bellows in, as shown in illustration, joins the ends by the bar (St), which is screwed down by the nut (F), affixed the air tube at point K F, and works the bellows vigorously for a few seconds in order to clear the pipe from chalk.

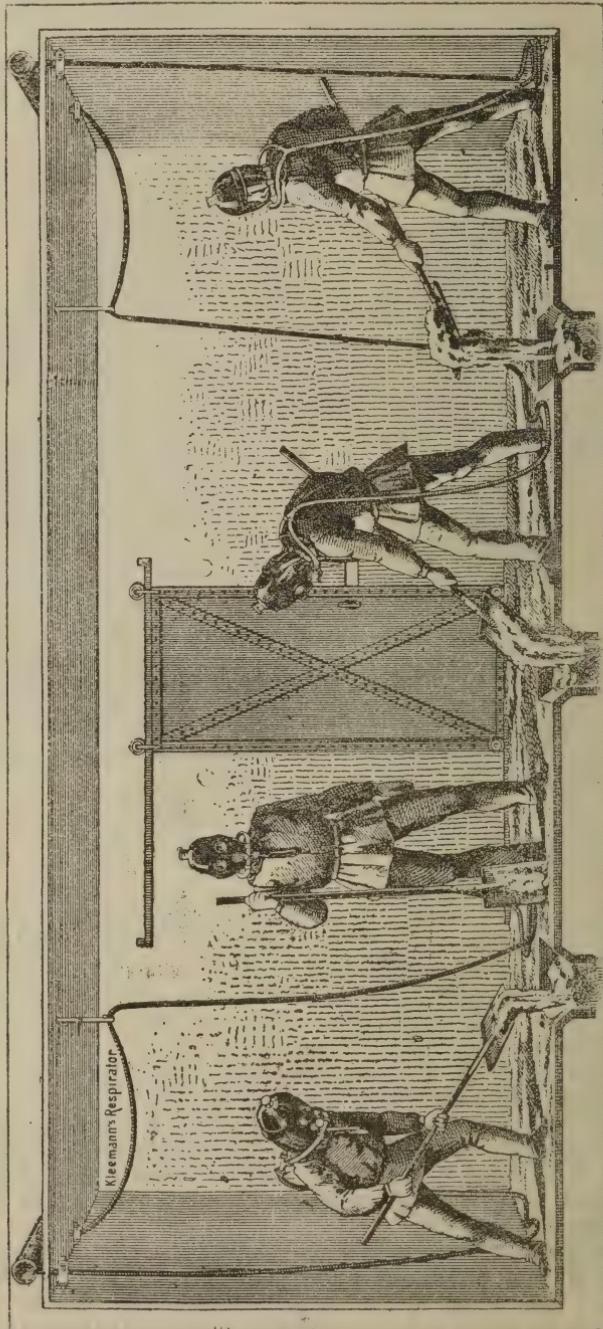
The other man then affixes the joint of the helmet to the free end of the air tube, and whilst his attendant is gently working the bellows, he puts the helmet on, stretches the soft neck leather even, and gradually buckles it tightly together by means of the strap (R).

The fresh air pumped into the helmet now continually flows round the face of the wearer and escapes through the valve (V).

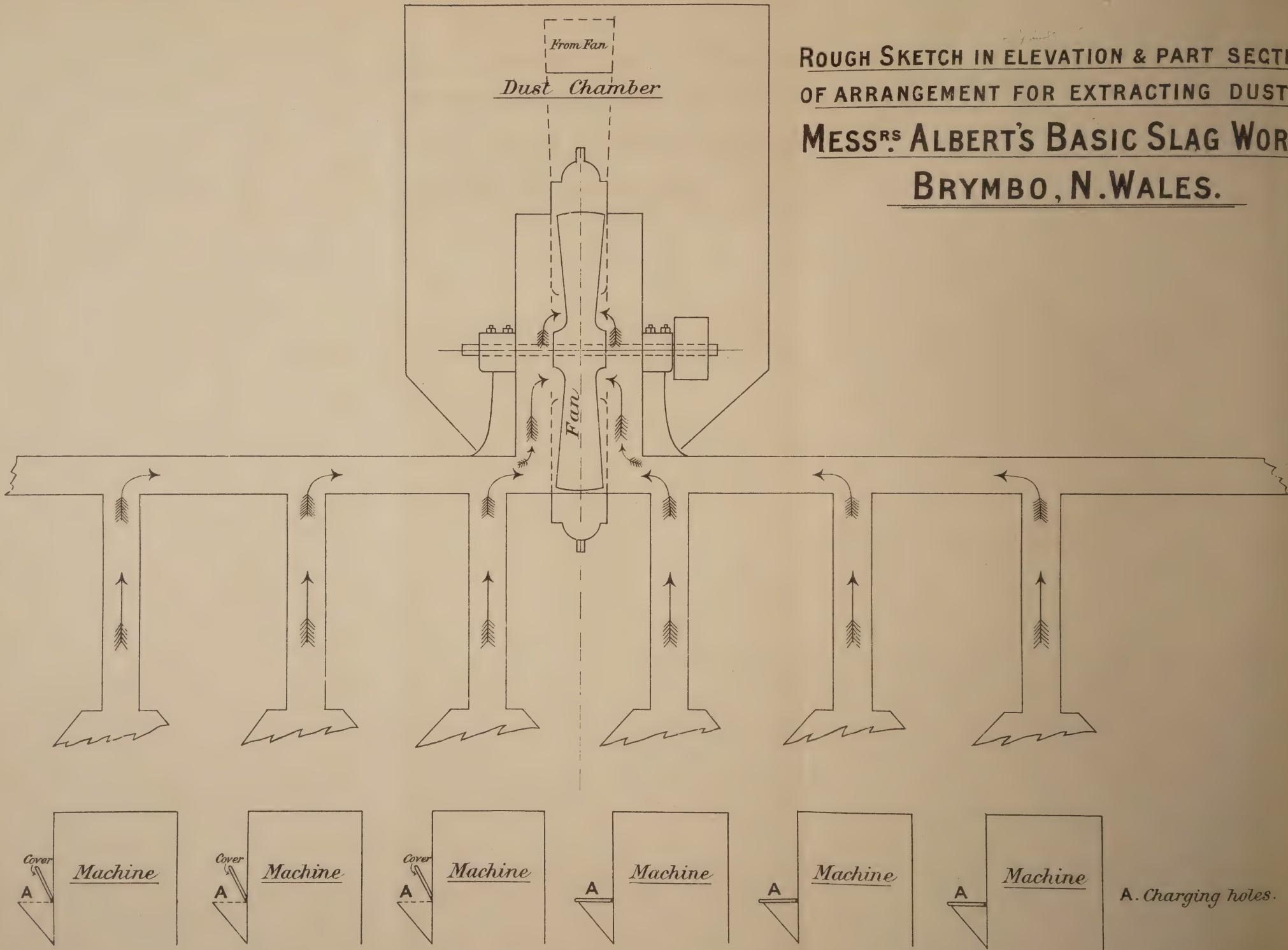
The slight pressure from the air current inside prevents any gases or smoke entering from outside, and the wearer of the mask can now safely enter and work in rooms filled with suffocating gases.

If a lamp is used it is fastened as shown in picture, and supplied with air by the main pipe.

Special estimates prepared for complete installations for fresh air supply to workers in
chemical factories a. p. illustration below.



ROUGH SKETCH IN ELEVATION & PART SECTION
OF ARRANGEMENT FOR EXTRACTING DUST AT
MESS^{RS} ALBERT'S BASIC SLAG WORKS
BRYMBO, N.WALES.



The works visited by Mr. Gould and reported on fully by him in 1893 appear to be of two classes, the first class comprising those works in which a considerable amount of free dust is generated and escapes into the mill. Of these there are four examples alluded to in his report. The second class consists of those in which new mills of the latest pattern are used for grinding the slag, and in which the process appears to be harmless, as in these there is hardly any escape of free dust. These are some three or four in number.

In two out of the four examples of the first class the new type of mill (made in Madgeburg) is gradually superseding the old, and thereby the original condition of these two works is constantly improving. Each of the remaining two of this class adopts a separate and totally distinct system of grinding, and these two, therefore, require careful watching and frequent visiting, but Mr. Gould is of opinion that, properly enforced, section 3 of the principal Act is amply sufficient to ensure healthy conditions in the factories mentioned.

It may be interesting in this connection to quote the medical aspect of the basic slag dust from Mr. Gould's second report :—

“Medical aspect of the Slag Dust.—The basic slag dust is stated on high medical authority to be non-poisonous in itself. But being in its nature extremely fine (a proportion of it being in fact almost impalpable), it has a tendency when inhaled to settle in the farthest ramifications of the air passages, and to induce in the mucous membrane of these a chronic state of irritation, thus rendering the larynx and bronchial tubes unduly susceptible of further mischief should the subject take cold; and in general creating a distinct predisposition to bronchitis and pneumonia. Moreover it is found that when pneumonia does supervene, a fatal result not infrequently follows with unusual rapidity; but even in a case of complete recovery from an acute attack the patient will be constantly liable to a recurrence of the same malady, as his breathing apparatus is continually undergoing deterioration so long as he is subject to the influence of the dust.”

Since writing his reports on the subject Mr. Gould has visited two more works, one of which may properly belong to the first class, and the other to the second, or harmless, class. To these respectively, of course, the above observations equally apply.

Mr. Hoare remarks :—

“By the judicious boxing of the stones or rollers and the using of fans to carry the dust into chambers, and finally into steam, I think the fearful atmosphere may be rendered harmless, and the workers be enabled to work without respirators, which are very trying to them.”

Mr. Hilditch has forwarded a drawing showing the arrangement for extracting dust at one of the principal basic slag works.

With reference to the special rules in force in works where they enamel iron plates, Mr. Knyvett, H.M. Inspector, Birmingham, remarks :—

“The health of the women and girls employed in the enamelling of iron tablets must always claim special consideration from an inspector in whose district that most unhealthy industry is carried on, and I am extremely pleased to be able to report a decided improvement in comparison with the unhappy record of 1894. I found it necessary in the

Basic slag manures.

early part of the year to summon two women (who were fined more heavily than they appeared to have anticipated) for not wearing the provided respirators while engaged in the dusting process, and possibly owing to that event, or, as I would prefer to hope, to a tardy realisation on the part of the workers of the danger attending their employment, more care has been taken in the observance of the special rules designed for their benefit, and with the increase of care there has been a corresponding decrease of illness. There have been no fatalities during the year, and I heartily congratulate the women and their employers on the improvement.

"The continuance of this improvement rests, as I have often said, to a large degree on the efforts of manufacturers, backed by those of H.M. Inspectors; but it rests in a very much larger degree on the care which the women choose to take of their own health, and for the taking of which they now possess every means."

On the same subject Mr. Crabtree, H.M. Junior Inspector for Birmingham, observes:—

"That the special rules have been of use in this process we have reliable evidence in the fact that during the past year we have registered no deaths in our district from lead poisoning, and have noted a diminution in the cases of illness. This satisfactory condition of things is largely attributable to the vigorous measures which have been taken by the medical officers in their examination of persons engaged, or about to be engaged, in this trade. From my perusal of the registers containing the monthly medical reports I have reason to believe that, but for this enforced provision, persons might have been employed who were utterly unfit for the work. The number of female young persons employed in the Birmingham factories is much less than formerly, firms having a preference for employees of mature years and established health. At the dusting and brushing benches I rarely find girls under 18 years of age. This is a wise proceeding which is sure to have a material effect on the health record of the factories under consideration. It is extremely difficult to persuade the youthful stripling in her early teens that the adoption of the measures set forth in the special rules are for her own physical good. She appears to think of little but her work and the pay-day, and is not infrequently to be found with her respirator in her pocket ready for use the moment a foreman, manager, or inspector appears on the scene. She dislikes respirator, head-gear, and overall, as being so many interferences. Her *general* inexperience accounts for much of this thoughtlessness. If she were kept from the enamelling processes for a few years she would all the more readily 'learn the trade,' and have more common sense to see to her self-protection. I have reason to believe that some of these early recruits persistently keep their respirators dangling under their chins and their head coverings either in the mess-room, at home, or lost. This state of things should not be. These are the very individuals who fall the earliest victims to plumbism, are most frequently under the doctor's care, and, fortunately for themselves, receive their early dismissal at his hands, as being unfit for the work. With the experienced women there is far less difficulty, as they are invariably willing to use some form of respirator, and to adopt the other measures provided; and their health generally is much more uniform than that of the younger hands. I can only hope that the practice of employing women instead of young persons in this trade will be extended.

"I find much objection taken to the early form of wire-gauze respirator. The gauze with its covering of cambric was said to be insuffi-



RESPIRATOR.

A **BRUSHER** of *Enamelled Iron Plates*.



RESPIRATOR.

A BRUSHER of *Enamelled Iron Plates.*

ciently percolative, so that the women were constantly breathing their own respired air. This produced sensations of stifling, owing to inhalation of excessive quantities of carbonic acid gas, and I was informed by some of the workpeople, whose words I could not doubt, that they were better in health without than with such respirator. But, obviously, the fault lay not with the principle of filtration so much as with the material and arrangement used in the respirator. The fixed frame-work upon which it was constructed did not fit closely to the face, and it did little more, in many cases, than half the work for which it was destined. In the Birmingham factories it has been abandoned in favour of a much simpler form, one which has been found to do its work more effectively, and has been more cordially welcomed by the employees.

"I beg to submit to you, sir, a photograph illustrating its use. It is composed of several folds of cambric of fine texture, arranged in an oval form. A small portion of the top edge is left unstitched, so that a piece of cotton-wool may be inserted into the bag. This cotton-wool renders the process of filtration much more perfect, and may be replenished at the pleasure of the wearer. The respirator readily adapts itself to the features and allows of no reservoir of respired air.

"Another form of respirator has been given to me recently by Mr. Cramp, H.M. Superintending Inspector. I have placed this before the camera, as in the preceding case. The photograph will indicate how it encloses the whole of the face below the eyes. This respirator is of still finer texture, and will doubtless form an effective barrier to the inhalation of lead-oxide particles. When next visiting enamelling works I will introduce this respirator to the notice of employers, and hope to report to you the result on a future occasion.

"I am persuaded that if these latter forms of respirators be continuously used and the other measures specialised in the rules honestly followed, the 'dangers' of the trade will be reduced to a minimum.

"While touching upon the influence of lead compounds, may I mention another sphere in which these compounds appear to operate. In my country work in and around Redditch I have found that the manufacture of glass-headed pins has, within the last two years, largely increased. On my visit to one of the factories so engaged a curious incident was related to me by the employer. On the adoption of this trade into his works he was anxious to secure the absolute safety of his hands from any noxious fumes which might arise in the process of liquefying the sticks of glass by Bunsen burners, and placed funnels of galvanized sheet-iron before every burner. These funnels were connected by tubes with a powerful fan, so that fumes and excessive temperature might at once be eliminated. The hands were set to work, and for a time all went well. Somewhat suddenly two or three of the girls fell ill, but causes external to the factory work were supposed to be found. Others, however, from the same room became similarly affected, until the number absent from some mysterious cause was well into the teens. The employer stopped the work, called in two local medical men, who concluded that the cases were those of metallic poisoning. The 'black line' of plumbism was clearly indicated, but whence came the mischief? The investigators had two lines of procedure; it must be poisoning by lead or by arsenic. The funnels being galvanized by zinc, which usually contains a small proportion of arsenic, were acted upon by a great heat evolved from the Bunsens. Thus arsenical vapours were at least probable. But the sticks of glass, which were of foreign manufacture, were found to contain an excessive quantity of lead, this

being a marked feature of the white sticks. It is therefore highly probable that these were cases of plumbism in an unexpected quarter. The employer disconnected the funnels, but continued the use of the fan. He obtained a fresh supply of glass, which, to the best of his knowledge, was free from lead, and the process has since been carried on without mishap. This incident leads me to believe that in close rooms where the Bunsens are near together, and where artificial ventilation is not resorted to, the use of certain kinds of glass may be productive of conditions calling for special attention."

Needle
manufacture.

In the needle trade the manufacturers generally adopt a most admirable system of fans to carry off the dust, and the following report from Mr. Crabtree will show how needful it is.

He observes :—

" During the year I have given some attention to the generation and control of dust in the needle factories of Redditch and the neighbourhood. I have collected various specimen quantities from the grinding machines, window sills, beams, ledges, and walls, and submitted them to magnification to the extent of about 200 diameters. For this purpose I used my ordinary $\frac{1}{2}$ -plate camera in conjunction with a 'West' microscope, and directed the most powerful sunlight I could obtain through a plano-convex condensing lens on to a *small portion* of the dust.

" I desired to obtain three images :—

- " 1. The quartz and steel dust combined ;
- " 2. The quartz dust more prominently than the steel dust ; and
- " 3. The steel dust alone.

" My first photograph disclosed a confused mass of quartz crystals of varying size and different angular forms, but whose surfaces were rough, and evidently forbidding to tender tissues like those of the bronchial tubes and air-cells of the lungs. Among these were, in less quantity, agglomerations of steel, which, having been whirled off from the grinding stone in a molten condition, had, in cooling, assumed a jagged, prickly shape, just such as would enable them to become fastened in the air-passages like so many hooks. This was a source of information which became immediately applicable. A workman suffering from lung affection came under my notice. He assured me that his ailment was much aggravated by the dust emanating from his stone, but, strangely enough, preferred to keep to this kind of work. I could now understand this man's violent efforts at expectoration when coughing. These infinitesimal spikes were constantly irritating and piercing the tender membranes of his lungs, and he had the greatest difficulty in ejecting them. At my request his master was perfectly willing to provide a fan. This was done, but the young fellow gradually sank. Since then I have requested all stone and emery grinders to be provided with exhaust fan arrangements, and I believe this has in all cases been carried out.

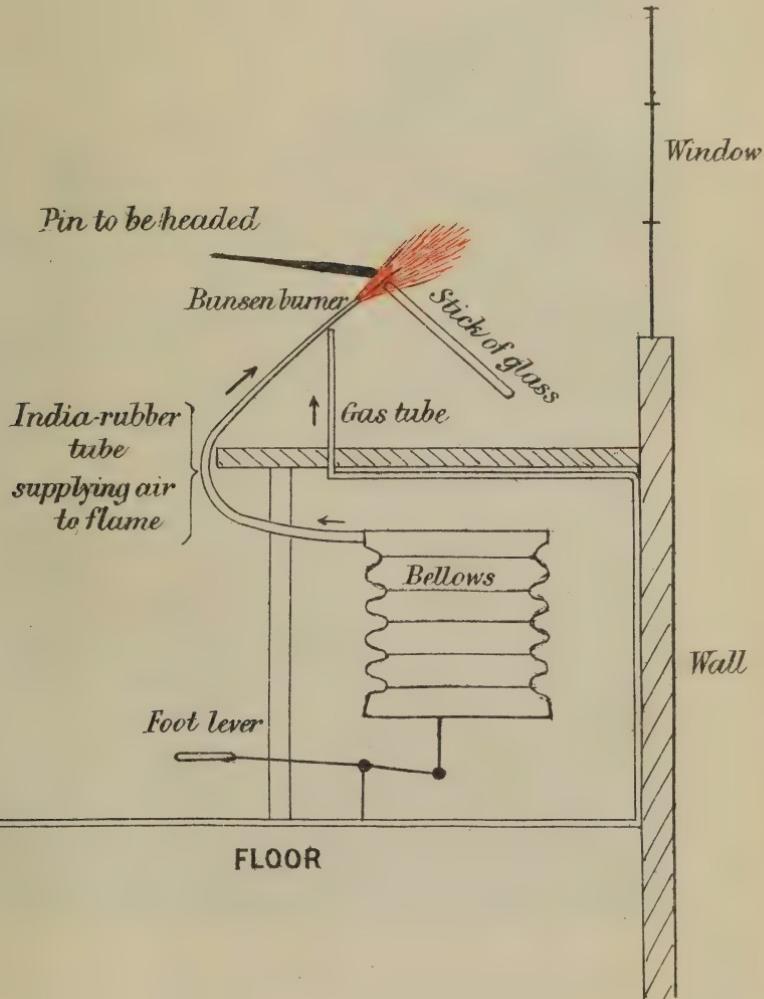
" Unfortunately, a very few of the men still lack sufficient common sense to see to the preservation of their own health, and I have occasionally had to remonstrate strongly with these for deliberately removing the dust funnel from the stone, and this, after the employer has spared no expense in their interest.

" The photograph also disclosed a small ball of steel which would appear to be less injurious than its neighbours.

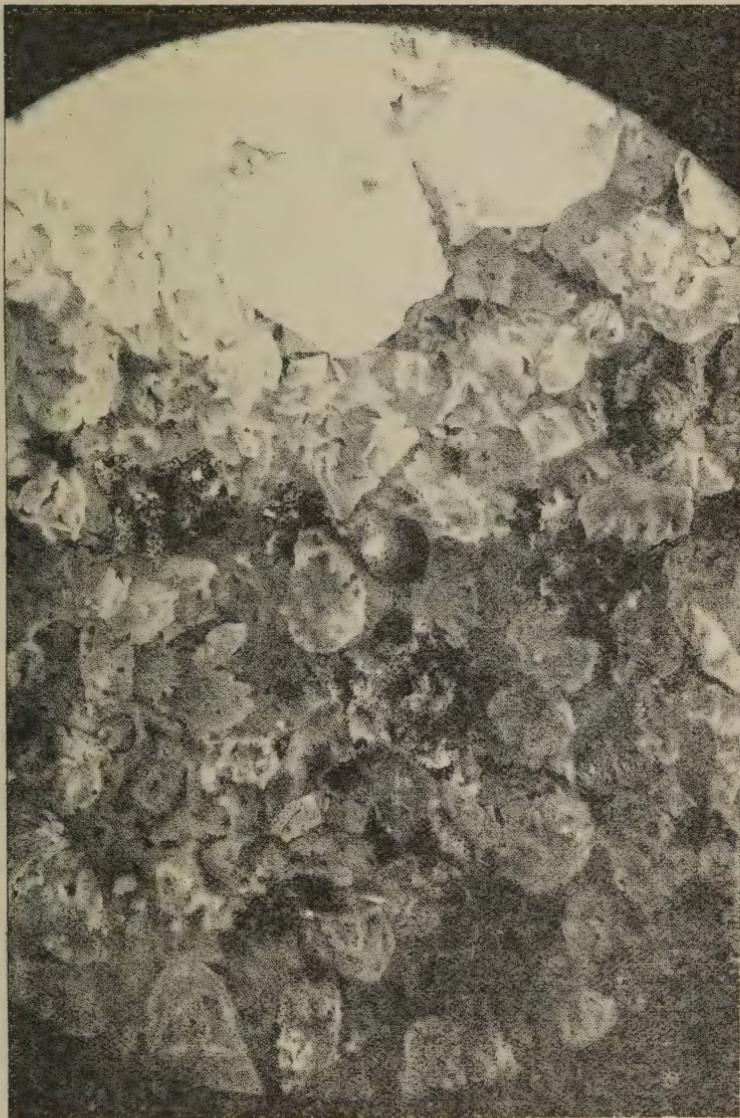
" My second photograph exhibits the quartz crystals more prominently, and leaves no room for doubt as to the mischief they may

GLASS HEADING PINS.

The following diagram will illustrate the process referred to:-

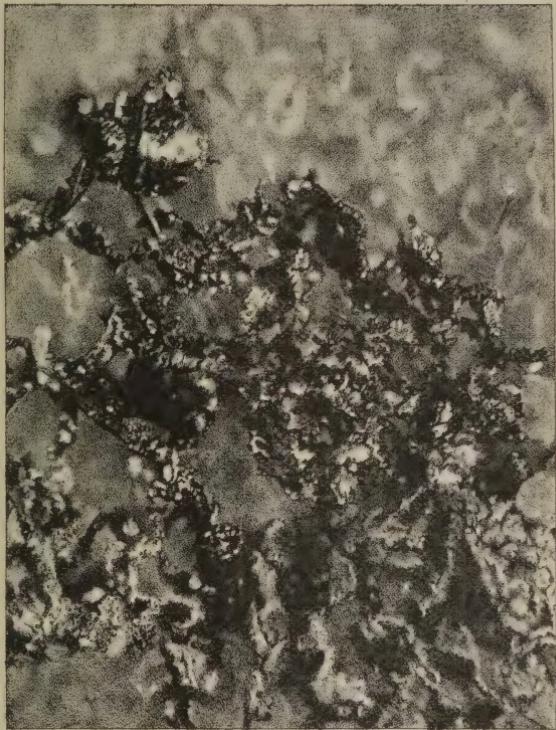


M^r Grabtree's Report



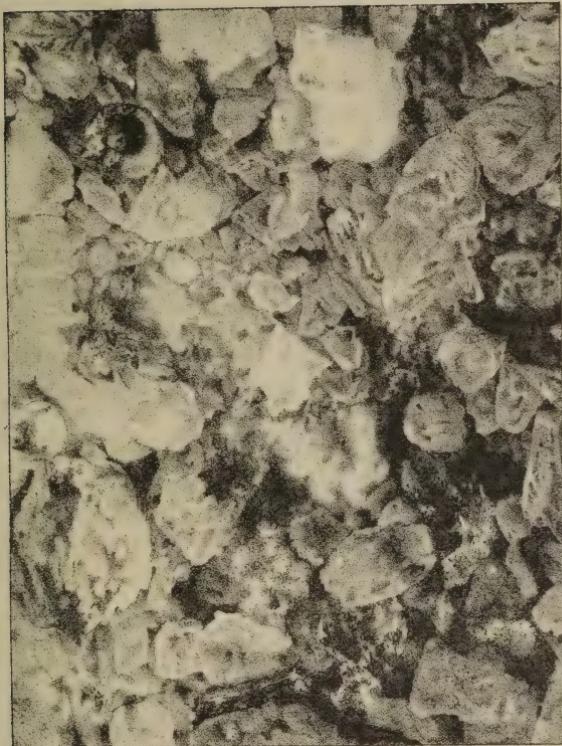
NEEDLE DUST—QUARTZ AND STEEL COMBINED.

M^r Crabtree's report



NEEDLE - DUST - STEEL SEPARATED FROM QUARTZ.

M^r Crabtree's Report.



NEEDLE-DUST- QUARTZ, MORE PROMINENTLY THAN STEEL.

cause. The third photograph received rather different treatment. I applied a bar magnet to the dust so as to isolate the steel from the quartz. By this means I secured a fair supply of the former, which, becoming magnetised, its pieces thus clung together.

"The same jagged features here present themselves as before. There are a few spherical steel bodies, but they are insignificant in number and volume compared with the spiked masses in which they are embedded.

"I am bound to conclude from these observations that if effective fan arrangements were not provided in our needle factories, particularly among the grinders, sickness and mortality from this source would be much more prevalent."

Mr. J. H. Walmsley, H.M. Inspector for the Pottery District, reports with reference to the Special Rules for Earthenware and China Industries :—

"*Earthenware.*—In these trades where the special rules have been in operation for about 12 months, sufficient time has not elapsed for any marked improvement to show itself as a result of their adoption. Recent prosecutions of operative potters (26 from one factory alone) will show how difficult it is to make the workers realise the importance of carrying out the rules, and it is only since these last prosecutions that any sign of compliance has been noticed amongst the majority of the workers. Very few, when questioned, seem to know anything about the special rules, nor the reasons advanced for their adoption, but appear to think it some additional hardship forced upon them by the Factory Department, to which the masters have been privy. I cannot let this opportunity pass without mentioning to you the firm, but kind, way in which the Potteries Stipendiary Magistrate (Mr. Harold Wright) has dealt with the breaches of the special rules brought before him. On all occasions has he impressed upon offenders the necessity for loyal compliance with the rules, inasmuch as their health would be improved thereby.

"As to cases of lead poisoning, I have interviewed some of our local medical men, and they tell me that cases of lead poisoning are not nearly so numerous as formerly. This cannot yet be the result of the special rules, but may be, and I trust is, the result of workers being more careful in their habits.

"I regret to learn that the number of in-patients at the North Stafford Infirmary is not showing any decrease.

"As for the women workers in the various departments where lead is used, I cannot but feel surprised that in several cases which have come to my notice this year where the women have been infirmary in-patients, they have, on being discharged 'relieved,' gone right back to their old occupation, and, in one case recently mentioned to you, a complete collapse has again occurred. I have remonstrated with several ground-layers for returning to the same kind of work after they have had one severe attack, but the higher wages for lead workers induces them to run all risks. The manufacturers will, next year, have some difficulty in complying with the new law requiring them to report all cases of lead-poisoning, for very few women, when they go away ill through the effects of lead, give the real reason of their absence.

"Dr. Parkhill, Certifying Surgeon for the Gresley district, writing me on this subject, says: 'On the whole, I might say that the cases are not so many or so severe as they formerly used to be. There are not many new cases. We get the old hands, who have been working

' amongst the lead for years, coming back now and then with their system pretty well full of it, but even these cases are not so numerous as formerly. I can see that some people are more susceptible to lead than others, and have to advise them to leave off any work bringing them in contact with lead.'

"In the arrangement for washing conveniences, the provision of towels is optional with the manufacturer. In cases where the firm has not supplied towels, the men have also omitted to do so, and on two occasions recently have I seen gloss-placers after washing their hands actually wipe their hands on their slops, which must have been covered with glaze dust.

"I hope, however, that in another 12 months this apathy on the part of the workers may be overcome, and that a real improvement in the condition of the workers may be reported.

"*Notification of certain diseases.—Lead poisoning.*—The statistics from these reports will be an excellent guide in the coming years, and will show what effect the special rules have had. In the annual return of number of employees, if the number of workers in lead were given, the comparison between cases of lead poisoning and number of lead workers would be very interesting."

Mr. Harston, H.M. Junior Inspector, Southampton, reports:—

"A firm of *Encaustic Tile* Manufacturers in my district have recently been experimenting with fritted lead with a view to ascertaining its general suitability for glazing purposes in the place of raw carbonate. The following is a copy of a letter which I received in answer to one I wrote to the firm asking to be acquainted with the results of the experiments, and the conclusions at which they have arrived I consider would seem to confirm the general opinion, that whilst fritted lead is less dangerous than when used in a raw state it is still soluble, and capable of producing deleterious effects, but that equally good results may be attained by adding a little soda or borax in the raw glaze.

" 18th December, 1895.

" " SIR,

" " In reply to your favour to hand yesterday, the only cases of plumbism that we are aware of having occurred at our works during the last year or so are two, both dippers, one that of a somewhat delicate man, who almost immediately showed signs of lead poisoning. He seems to have neglected washing and been generally careless. The other case was that of a man who had been a dipper for some years, and had previously suffered from lead poisoning. The first mentioned has been entirely removed from contact with the lead, and for the other man arrangements have been made to keep him from contact with it as much as possible, with the result that he has not been ill since. There has been no other case that we know of with any of the other dippers or Magolica paintresses, but they are all very particular as to cleanliness. It all seems to turn on this point, and we would suggest that the washing basins, with a plentiful supply of hot and cold water, should, where possible, be placed near to where the men work, so that the loss of time and inconvenience may be reduced to a minimum. Some of our dippers wash their hands more than a dozen times a day, and use an astonishing amount of soap. Some of these men have been dipping for years and have never been, so far as we know, in the least affected.

"As to fritted lead we see no reason why it should not be used instead of the raw carbonate, except that it would be more expensive, and the recipes we now use would require altering, thus causing some inconvenience and annoyance; but the carbonate is in no way absolutely necessary, in our opinion. We do not, however, think that fritted lead would get over the difficulty. It is not so readily soluble as the carbonate in the acid of the perspiration, but it is soluble, and cleanliness would be just as imperative. Fritted glazes are supposed by the trade to be much less dangerous than raw glazes; but we are inclined to think that this is mostly owing to the fact that fritted glazes have invariably an alkaline reaction, owing to a small amount of the borax or soda becoming dissolved, thus the acid of the hands is neutralised, and consequently cannot act upon the lead. Raw glazes are seldom alkaline. Possibly, if they were made so by the addition of a little soda or borax they would be just as good as fritted glazes. We are inclined to think so.

"After all, cleanliness is the best preventative, and if there are some predisposed to lead poisoning the masters should endeavour to find other employment for them after the second or third attack. During the last 20 years we may have had four or five who have shown symptoms of plumbism, but only in one of these cases has it been at all serious. Here it was followed by slight paralysis of the right hand, but as this man is still an organist at one of the churches in the town you will readily see that the most serious case we have had has not been very bad. Provided the arrangements for the men's washing are all right, we believe that nine cases out of ten are owing to carelessness on the part of the men themselves. In our somewhat limited experience it has always been the dirty and slovenly that have been attacked.

"We are, Sir,

"Yours obediently,

"———,"

Mr. Bellhouse, H.M. Inspector, Dublin, remarks:—

"I have very few places in my district that come under the heading of 'dangerous trades,' and such as I have are not of any great importance. The only two places I think it necessary to mention are the two match factories. I have found both of them willing to adopt the extra precautions laid down in the special rules, but as there has never been any real case of illness in either factory, it is difficult to say to what extent the hands have benefited thereby."

Major Roe, H.M. Inspector, Birmingham, observes:—

"As previously reported, I have but few manufactures coming within this category, but in the few which there are in my district I have found that the special rules are generally complied with, and they certainly tend to draw attention to the dangerous results which might occur if they were neglected by either the employers or their work-people."

Mr. Lewis reports:—

"In lucifer-match, white-lead, lead-smelting, earthenware, and chemical works, I am pleased to be able to report that manufacturers and managers, with but very rare exceptions, observe the spirit of the special rules which are applicable to their respective trades, and have provided the equipment necessary for the carrying out of the same in detail.

But, as I said in my last report, the workpeople have not taken kindly to certain of the special provisions which have been prescribed solely in their interest; and in some factories I have in the course of my visits of inspection had occasion to remind operatives (male and female) of their penal liability under section 9, Act 1891, if found contravening a special rule. As to results effected by special rules in dangerous trades, I think certifying surgeons and works doctors, if applied to, would report favourably.

"As far as my observations entitle me to express an opinion, I should most certainly say that the special rules have operated in the direction of improving the works' surroundings, and the general conditions under which the workers in these acknowledged dangerous trades carry on their duties.

Mr. Hoare remarks with reference to special rules:—

"These, as far as I am able to judge, are proving beneficial, but the masters are more willing to carry them out than the operatives. With the latter habits of cleanliness are of slow growth. Amongst the women anything which they consider detracts from their personal appearance, such as the head coverings usually provided, or prevent's them having free use of their tongues, such as respirators, are objected to, or worn in an unsatisfactory manner.

"I think wearing overalls is more objected to in the Midlands than in the Eastern Counties.

Mr. Hilditch observes:—

"I have not, as yet, been able to discover any marked results attending the introduction of special rules. Speaking generally, from information obtained from occupiers and men, and also by personal observation, I am inclined to think that the rules in force have been the means of making men more careful in their habits of cleanliness.

"The use of overalls must be attendant with good results. Whereas, men before their introduction were often found working in thin and tattered clothing, which afforded no protection whatever to the body, they are now comfortably clad. I often find that men discard the use of the overall jackets, saying they cannot work in them with freedom.

"Workers in potassic chlorate mills are invariably found working in their shirt sleeves, owing to the very high temperature in these places.

"H.M. Superintending-Inspector Mr. Cramp, when visiting one of these mills with me in July last, suggested the use of small flannel shirts with short sleeves, in lieu of the jackets, which could be changed for the ordinary wearing shirt during meal times, and I believe the firm will take the matter in hand as soon as the present stock of jackets is exhausted.

"Respirators of various patterns supplied by firms at considerable expense have been almost discarded in favour of the old-fashioned handkerchief tied round the mouth and nostrils.

"Baths are not made as much use of by the men as they might be."

Chromate of lead.

Mr. Rogers, H.M. Inspector, Manchester, remarks with reference to the use of chromate of lead:—

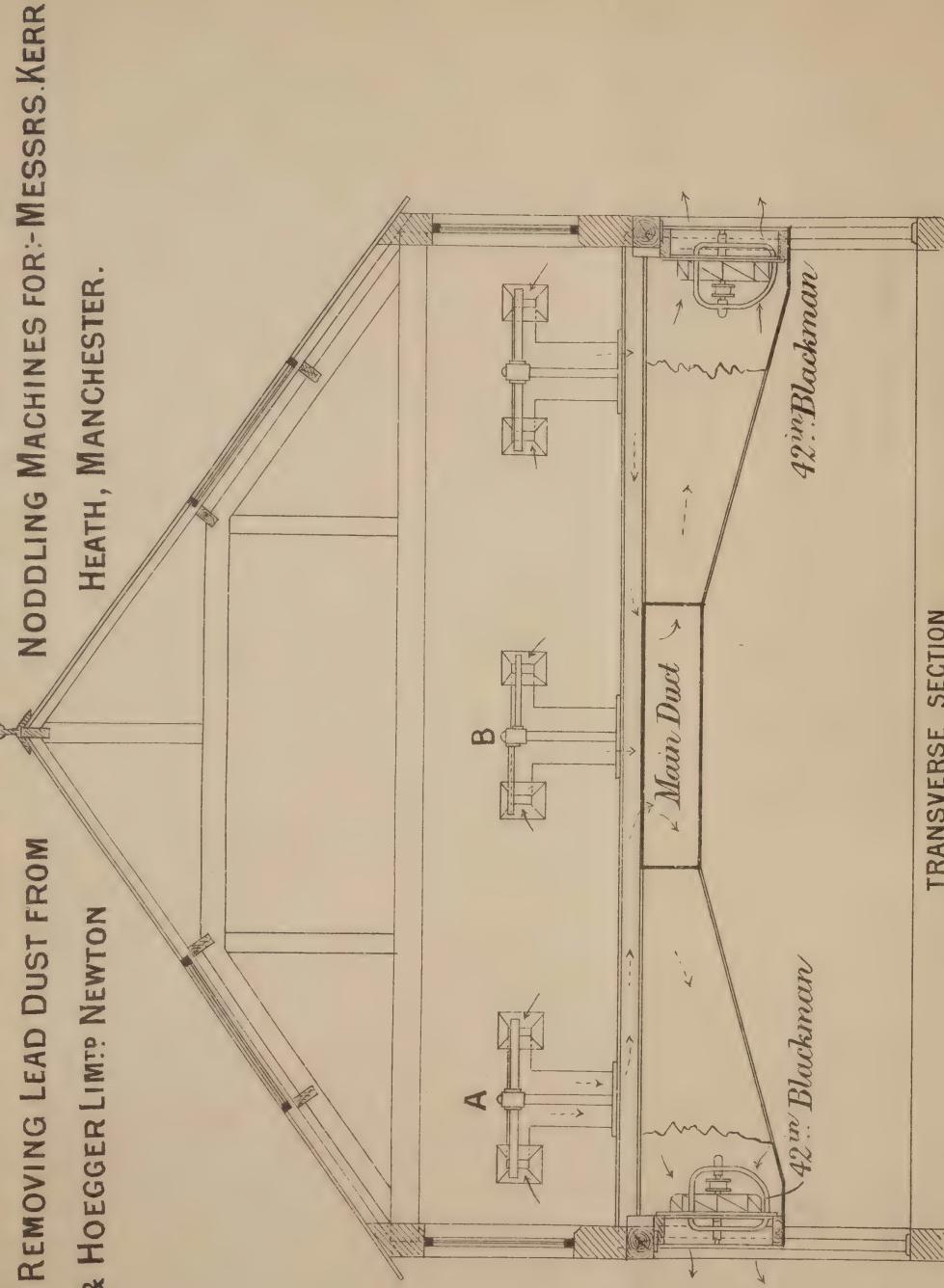
"The injury to the health of the workers in this process has been very pronounced. The injurious work is that of stretching, straightening, and pressing cotton yarn dyed with chromate of lead, a considerable amount of dust being given off in this operation, which is known in the trade as 'noddling.'

"In a noddling room I visited most had recently suffered from lead poisoning, and with very few exceptions, all had a well-marked blue line

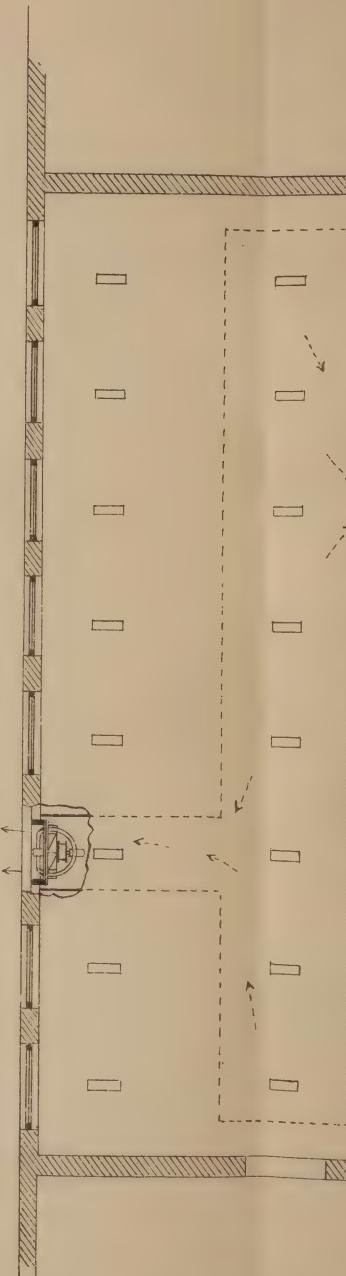
APPLICATION OF 2-42^{inch} BLACKMAN FANS

FOR REMOVING LEAD DUST FROM
& HOEGGER LTDTM NEWTON

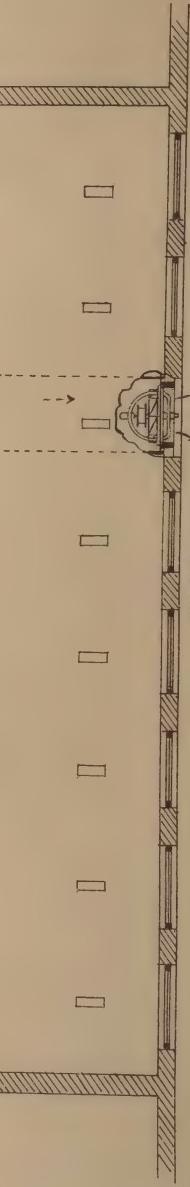
NODDLING MACHINES FOR:-MESSRS.KERR
HEATH, MANCHESTER.



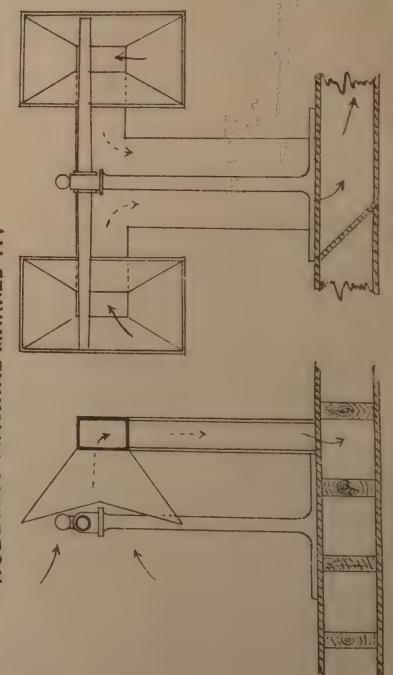
TRANSVERSE SECTION.



PLAN.



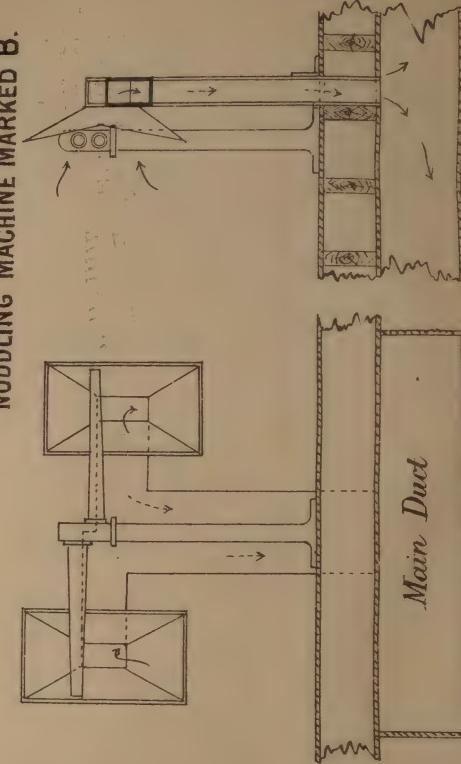
NODDLING MACHINE MARKED A.



ELEVATION.

SECTION

NODDLING MACHINE MARKED B.



ELEVATION.

SECTION

on the gums, in some cases after only a few weeks work, nine of the usual workers in this room were incapacitated and receiving medical treatment for lead poisoning; one of these persons died about the time of my visit and an inquest was held. Up to that time very little had been done by the employers to counteract the influence of the lead dust and render the work less injurious. They had provided a few respirators, but the people had refused to wear them, and a fan was extracting a small part of the dust from the room.

"I am very pleased to be able to report that an entirely different state of things prevails at this factory now. As soon as possible special rules were framed and applied by the Department, but before this was done the firm, at my suggestion, adopted a more stringent code of rules than that which was afterwards put in force. They have re-built part of the factory, providing excellent lavatories and meal rooms, and have, quite regardless of expense, adopted the best known methods of extracting the poisonous lead dust. I send sketches of the Blackman Ventilating Company's scheme of dust extraction which has been carried out in the factory. The dust is given off near the horizontal bars of the 'noddling' frame shown in the sketch, and from the system of hoods adopted it will be seen it is extracted before it can escape into the room or fall to the floor. A medical man visits the works every fortnight to examine the workers. He keeps a register and prescribes medicine, which the firm supply to such as need it. Those persons who, after a short trial, are found to be peculiarly susceptible to the lead influence are removed from the room by the doctor's orders, and the firm endeavour to find work for them in other departments. A further excellent precaution is that the firm have appointed three of the workers to visit any of their fellows who absent themselves from the factory, and if the absence was found to be due to lead poisoning free medical attendance and an allowance of money or food has been given.

"The result of these precautions and of those prescribed by the Special Rules is shown in the present condition of the workers. At my last visit to the factory there were 60 persons employed in this dangerous operation and all testified to a great improvement in their health and comfort, *none* were incapacitated for work and only *two* were receiving special medicine, these two were, however, doing their ordinary work and only slightly unwell.

"Through the wise regulation of the new Act that all cases of industrial lead poisoning shall be reported and consequently investigated it will, fortunately, be impossible for conditions such as prevailed a year ago in the factory referred to above to be in existence in future in any place under our supervision.

"In this connection I would acknowledge the valuable assistance I have received in this and other inquiries where medical experience is desirable from the Medical Officer of Health for Manchester (Dr. Niven).

Mr. J. Jackson, H.M. Junior Inspector of Factories, Liverpool, remarks with reference to the use of chrome yellow in the making-up rooms of dye works and hank-winding rooms of dye works and textile factories:—

"A recent case of lead poisoning having occurred in the making-up room of a yarn dye works in Manchester has called attention to this class of work. For many years (over 10) before I entered the service I was in business as a cotton yarn doubler, making almost entirely coloured yarns, and I, therefore, feel that I am in a position to speak with the

Chrome yellow
in dye works,
&c.

authority founded upon a close practical acquaintance with the subject. During the time I was engaged in this business many thousand bundles of 'orange' or 'yellow' dyed yarns were wound in my mill, but without a single case of lead poisoning or illness being caused. This, I contend, was due to the fact that my winders were always cautioned when such work was given out to cover up their mouths and nostrils and be careful to wash before meals. After a case that occurred at a dye works some years ago, I offered to provide respirators, but this was declined, the women preferring to pin round their mouths the small shoulder shawls they all wear in the mill. Of late years several new dyes for orange and yellow have been introduced which do not contain lead, but for shipping the 'chrome' (*i.e.*, lead) dyes are preferred.

"The process of 'noddling' yarn consists of shaking out the yarn by placing one end of the hanks on a hook or projecting arm (called a 'shaker') to straighten the threads, a bundle of hanks is then taken one side in each hand, and a twist given to it, to form a hard end, called a 'knot.' These knots are placed in a press and squeezed into a 'bundle,' the twisted end of the knots form, what is called the 'head of the bundle,' or face.

"The danger arises from the fact that in 'noddling' the hands are in constant contact with the lead-dyed yarn, and when 'shaking' the yarn the hooks are so placed that the dust (composed of dyed fluff and minute particles of chromate of lead) rises directly under the mouth and nostrils of the worker. On account of the light work, and also of 'cheapness,' boys and girls are generally employed as 'noddlers,' and a man in charge does the pressing-up of the bundles.

"For the purpose of making coloured stripes in cotton cloths; *e.g.*, Grandrill shirtings, fancy dress summer goods, &c., as well as for making a class of yarn called 'Grandrill' in cotton doubling mills, cotton yarn, dyed in the hank, is wound at the mills upon bobbins. In these cases, yellow or orange chrome-dyed yarns form a part, but not the chief part, of the colours used; greens, containing arsenic, are also used, but I should say that indigo-dyed blue, or 'logwood black,' forms the chief colours.

"The danger, in my opinion, to the women employed as hank winders, is as great, if not greater, than to those working at 'noddling' yarns. The hanks are taken and individually shaken on a shaker (as in the former case of noddlers) to 'open them out,' and during this process, as well as in the operation of 'winding,' dust, composed of dyed fluff and particles of the dye stuff, rises continually. It is close work and the winders have to bend constantly over it. I have many times seen everything in the neighbourhood of the hank-winding frames covered with this dust to such an extent that it was possible to tell at a glance what colour of yarn was principally being used, from the prevailing 'tone' of the surroundings, and a bobbin of white yarn would in a day be so covered with fluff that it appeared, at a short distance away, to be coloured yarn. The women's hands get stained with the dye so badly at times that it will not come off with ordinary washing, and their hair, too, becomes covered with the dyed fluff.

"I have felt for a long time that this was a case where the special rules might with great advantage be applied."

Miss Anderson observes:—

"In every way the work appears to me, if precautions are not stringently observed, as deadly in character as the enamelling of iron plates by lead arsenic or antimony, which are now under special regulations.

"I visited the Royal Infirmary and had a long interview with one of the girls who had been employed at these works, who was still in bed under treatment, after 18 weeks illness.

"Her evidence showed the extremely dangerous character of the work, and the necessity for special regulations. The results on the workers are the same as in other cases of lead poisoning."

Captain May remarks:—

"Heavily weighted yarn is all dyed for the Eastern markets, India, Persia, &c.

"Dyers and others unanimously assure me that export yarn is always more heavily weighted than is necessary for the production of the colour.

"The yarn is sent by shippers to dyers in 10-lb. bundles, and the requisite depth of colour can be produced without increasing the weight to more than 11 or $11\frac{1}{2}$ lbs., but the order is accompanied by instructions that the weight is to be raised to 13, 14, or in some cases 15 lbs.

"A 10-lb. bundle made to weigh 15 lbs. (*i.e.* 10 lbs. of cotton and 5 lbs. of dye), will be divided into three 5-lb. bundles, and the yarn thus treated is sold by weight."

The manager of one of the principal dye-works told Captain May that his firm declined two or three orders on account of what they considered the dishonesty involved.

The following Order was gazetted 19th April 1895:—

FACTORY AND WORKSHOP ACTS, 1878 TO 1891.

Whereas by section 8 (1) of the Factory and Workshop Act, 1891, it is enacted that:—

"Where the Secretary of State certifies that in his opinion any machinery or process or particular description of manual labour used in a factory or workshop (other than a domestic workshop) is dangerous or injurious to health, or dangerous to life or limb, either generally or in case of women, children, or any other class of persons, or that the provision for the admission of fresh air is not sufficient, or that the quantity of dust generated or inhaled in any factory or workshop is dangerous or injurious to health, the Chief Inspector may serve on the occupier of the factory or workshop a notice in writing, either proposing such special rules or requiring the adoption of such special measures as appear to the Chief Inspector to be reasonably practicable, and to meet the necessities of the case."

Now I, the Right Honourable Herbert Henry Asquith, one of Her Majesty's Principal Secretaries of State, do hereby certify that in my opinion such process carried on in factories and workshops, or parts thereof, as are named in the Schedule hereunder, are dangerous or injurious to health.

Whitehall, 9th April 1895.

H. H. ASQUITH.

SCHEDULE.

Processes in which yellow chromate of lead is used or in which goods dyed with it undergo the process of bundling or noddling, winding, reeling, weaving, or any other treatment.

Subsequently the following special rules were prepared and are now in force :—

FACTORY AND WORKSHOP ACTS, 1878 TO 1891.**SPECIAL RULES.**

FACTORIES OR WORKSHOPS in which **YELLOW CHROMATE OF LEAD** is used, or in which Goods dyed with it undergo the processes of Bundling or Noddling, Winding, Reeling, Weaving, or any other Treatment.

Duties of Occupiers.

They shall provide washing conveniences, with a sufficient supply of hot and cold water, soap, nail brushes, and towels.

They shall provide respirators and overall suits for the persons employed in all dry processes.

They shall provide fans or other suitable means of ventilation wherever dust is generated in the process of manufacture.

They shall provide a sufficient supply of Epsom salts and of the sanitary drink mentioned below, or some other approved by H.M. Inspector of Factories.

Respirators	$\left\{ \begin{array}{l} \text{A good respirator is a cambric bag} \\ \text{with or without a thin flexible} \\ \text{wire made to fit over the nose.} \end{array} \right.$
Sanitary drink	$\left\{ \begin{array}{ll} \text{Sulphate of magnesia} & - 2 \text{ ozs.} \\ \text{Water} & - \quad 1 \text{ gallon.} \\ \text{Essence of lemon} & \text{sufficient to flavour.} \end{array} \right.$

Duties of Persons Employed.

Every person to whom is supplied a respirator or overall suit shall wear the same when at the special work for which such are provided.

Every person shall carefully clean and wash hands and face before meals and before leaving the works.

No food shall be eaten in any part of the works in which yellow chromate of lead is used in the manufacture.

R. E. SPRAGUE ORAM,
H.M. Chief Inspector of Factories.

Under section 9, Factory Act, 1891, any person who is bound to observe any special rules is liable to penalties for non-compliance with such special rules.

Dr. Sinclair White in his lecture before the Sanitary Institute truly observes: "Each skilled artisan represents a certain

" amount of wealth to the nation, and his premature death or
 " disablement from preventible causes is a direct and unnecessary
 " loss to the country, while indirectly it leads to the same result,
 " by swelling the burden of providing out of the public purse for
 " those who are dependent on his labour for sustenance.

BRASS TRADES COMMITTEE.

The following report has been received from the Departmental Committee on the Conditions of Labour in the Manufacture of Brass and of Kindred Amalgams:—

WARRANT APPOINTING COMMITTEE.

I hereby appoint—

WILLIAM DAWKINS CRAMP, Esquire, one of Her Majesty's Superintending Inspectors of Factories and Workshops;
 ROBERT MICHAEL SIMON, Esquire, Doctor of Medicine;
 WILLIAM R. LANE, Esquire;
 WILLIAM JOHN DAVIS, Esquire; and
 SEYMOUR HENRY KNYVETT, Esquire, one of Her Majesty's Inspectors of Factories and Workshops;

to be a Committee to make inquiry into, and report on, the conditions of work as they affect the health of the operatives in the processes of brass casting and mixing, brass dipping, polishing and finishing, and in all other processes in the brass manufacture; and also in the casting and mixing of gun metal, bell metal, and other kindred amalgams; and, in particular, to report what, if any, special rules should be made under section 8 of the Factory and Workshops Acts, 1891, for the protection of the persons employed in such processes; and whether the special rules so made should be applicable to all works in which such processes are carried on, or whether any exception should be made in cases where brass casting, &c. is only a subsidiary operation.

I appoint Mr. Cramp Chairman, Mr. Knyvett Secretary to the Committee.

(Signed) H. H. ASQUITH,
 Home Office, One of Her Majesty's Principal
 19th November 1894. Secretaries of State.

COMPOSITION OF COMMITTEE.

William Dawkins Cramp, one of Her Majesty's Superintending Inspectors of Factories (Chairman).

Robert Michael Simon, B.A. Cantab., M.D., F.R.C.P. London, Physician to the General Hospital, Birmingham.

William Reuben Lane, Managing Director, Messrs. Winfield's, Limited, Brassfounders, Birmingham.

William John Davis, General Secretary to the National Society of Amalgamated Brassworkers.

Seymour Henry Knyvett, M.A., Her Majesty's Inspector of Factories, Birmingham District (Secretary).

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REPORT of the DEPARTMENTAL COMMITTEE appointed to inquire into the CONDITIONS of LABOUR in the MANUFACTURE of BRASS, and of kindred AMALGAMS.

To the Right Honourable Herbert Henry Asquith, Q.C., M.P., Her Majesty's Principal Secretary of State for the Home Department.

SIR,

1. YOUR Committee have inquired into the matters concerning which they were honoured by receiving your instructions, and they beg leave to present to you the following Report.

2. Although they devoted the larger share of their care to studying the conditions of work in Birmingham, as being the chief seat of the manufacture of brass in the kingdom, they extended their inquiry to Willenhall, Wolverhampton, Edinburgh, Glasgow, Sheffield, Rotherham, and to various districts in the metropolis.

3. They are aware that the conditions of such an industry as the one claiming their attention, must in some minor respects be subject to local peculiarities and variations, arising from the different requirements of local trade as to castings and other articles of brass manufacture.

4. They would therefore have been pleased, had the time at their disposal allowed, to have visited other seats of the brass trade, such as Leeds, Manchester, or Bristol.

5. From the inquiries, however, which they have made from persons well acquainted with the nature and methods of the industry in those centres, the Committee are of opinion that it is improbable that any facts of serious importance would have added, through such visits, to the detailed and valuable information which they had acquired elsewhere.

6. Sixty-six brass foundries were visited by the Committee during the progress of the inquiry, and 76 witnesses were examined at special meetings held for the reception of evidence in Birmingham, Wolverhampton, Glasgow, Sheffield, and London. The witnesses comprised a physician at the Queen's Hospital, Birmingham, six of Her Majesty's Inspectors of Factories, 33 manufacturers or managers, and 36 artisans in various processes in the brass trade.

The answers from witnesses numbered 4,486.

7. The Committee have further derived much and varied information from the following sources, viz.:—

The Fourth Report of the Medical Officer of the Privy Council, 1861.

The Third Report of the Children's Employment Committee.

Volume three of Registrar General's Return of the Census of England and Wales, 1891, dealing with occupations, &c.

The decennial supplement to the Registrar General's Forty-fifth Annual Report.

Statistics supplied by friendly and insurance societies touching brass casters.

Statistics supplied by firms dealing with private sick clubs.

The "Hygiene Diseases and Mortality of Occupations," by J. T. Arlidge, M.D., A.B. (Lond.), F.R.C.P. (Lond.), &c., &c.

"Mixed Metals or Metallic Alloys," by Arthur H. Hiorns, Principal of the Metallurgical Section, Birmingham and Midland Institute.

The "Industrial Classes and Industrial Statistics," by G. Phillips Bevan, F.G.S.

A report addressed to the Committee by Mr. Thomas Jeffers, secretary to the Brass Founders' Association, Liverpool.

A paper communicated to the "British Medical Journal," by Dr. Simon, a member of the Committee.

An address delivered by Dr. Simon at the Parkes Sanitary Institute, London, November 29th, 1894.

A report to the Committee by Mr. W. R. Lane, one of the members, on strip casting and other processes in connexion with brass work.

A report to the Committee by Mr. W. J. Davis, a member thereof, on the process of sand casting.

Various plans and sketches of the construction of casting shops, supplied by manufacturers to the Committee, and sketches of fan and other means of ventilation of polishing rooms, similarly supplied.

Some analyses of deposits, collected in casting shops by the Committee, by Alfred Bosteck Hill, M.D., D.Pn., Camb., &c.

8. While not considering it needful to insert these reports and documents in the form of an Appendix to the Report, the Committee desire to express their deep sense of obligation to the various firms and persons who have by these means added so much to the value of the results of the present inquiry.

9. The reports of the Registrar General classify brass workers with those in other metal trades, including lead. The figures contained therein afford, consequently, no specific information respecting the subject of inquiry.

10. There appears to be a very general feeling amongst the authorities of friendly and insurance societies, that brass casting is an unhealthy occupation, requiring differential rates of premium, and of relief; but on investigation it was found that this feeling is based merely on a generally accepted view of the subject, rather than on any available statistics.

11. For the purposes of this Report it may be deemed sufficient to state briefly, that the manufacture of articles of brass consists of three stages, namely, the creative, the formative, and the compleutive.

12. In the first of these stages, an alloy is made at a very high temperature, in crucibles which are plunged into sunken furnaces. The principal components of this alloy are copper and zinc (which latter is commonly called speiter) mixed in proportions varying in accordance with the quality of brass required. Old copper and brass scrap are also not unfrequently used.

13. The alloy thus mixed is then either poured into iron moulds or ingots, to be re-melted when required, or is at once treated in the second of these stages mentioned above and poured into moulds which have been already prepared by patterns to receive the metal, and in which the formation of the various castings takes place.

Previously to receiving the metal, the mould has to be dusted all over with fine dust, made of different materials according to the requirements of the work. The ordinary materials are burnt loam, sand, burnt red brick, pounded and subsequently ground charcoal, French chalk, and bean flour. This dust is contained in a bag of calico, and escapes through the texture on the bag being shaken.

14. The moulds just mentioned are, roughly speaking, iron rims clamped together and filled with very fine sand in which the patterns have left impressions for the reception of the metal; and this process is in consequence termed sand casting.

15. Should the metal be required for sheets, tubes, or wire, it is poured into iron moulds or ingots, to be subsequently rolled or drawn as required; and this process is called sheet or strip casting.

16. The brass article or casting, having thus obtained its shape, is subjected to further processes on its way to completion. These are (1) that of dipping in aqua fortis and in acid solutions of various strengths, for the purpose of removing oxidation and impurities; (2) that of burnishing or of polishing at a lathe to acquire a smooth surface; (3) that of finishing or dressing; and finally (4) that of lacquering, which is an application of a solution of shellac to the work (specially heated for its reception on a stove) with a view of securing the colour obtained; also (5) a process of bronzing is also undergone when a particular effect is desired in the appearance of the article.

17. At the outset of their inquiry the Committee were in possession of considerable evidence derived (1) from a perusal of the medical literature dealing with the subject; and (2) from the experience of the hospital authorities in Birmingham, that brass workers as a class are extensively liable to diseases of the respiratory organs, such as bronchitis, asthma, and even phthisis.

18. It is also known that such brass workers as were employed in the mixing or pouring of the metal, as already described, or in the preparation of the moulds to receive the molten metal (which process is, as a rule, carried on within the casting shop) suffered from a well defined form of illness which had obtained a name amongst themselves of "brass founders' ague."

19. The symptoms of this illness are shivering, vomiting, and acute depression, appearing usually at the termination of the day's work, and

most frequently after the interval in work caused at the week end, or by a holiday. The symptoms were of a transient character, and presented none of the intermittent features of ague, properly so called.

20. Of the existence of these symptoms, and of the very painful, however transient effect they produce on the workers, the Committee have during the process of their inquiry, met with ample evidence.

21. Opinion has been found to differ amongst all classes of witnesses as to whether greater evil results from the irritation of the bronchial tubes caused by the inhalation of dust or of acid fumes; or from the gastric and general disturbance commonly known as the ague.

But the attention of the Committee was specially drawn to the latter form of illness and to a consideration of its causes, not more by the evidence of the witnesses called before them than by their personal observation and experience made while visiting casting shops. They propose therefore to give to this "ague" the most important position in their Report.

22. At the time of the pouring of the metal into the moulds or ingots, as above described, fumes are thrown off which are mainly composed of oxide of zinc. These fumes are formed by the volatilisation of the metals mixed, and ascend with more or less rapidity in proportion to the density or moisture of the atmosphere; and unless they escape entirely, are precipitated in the form of snow-white flakes on the walls and contents of the casting shop, and there is practically no doubt that these fumes are the efficient cause of the disorders to which brass casters are liable.

23. An analysis taken, for the purpose of the Committee, by Dr. Alfred Bostock Hill, analytical chemist, of Birmingham, of a deposit resulting from the pouring of common or yellow brass, yielded the following results:—

Moisture	-	-	-	9·64
Organic matter	-	-	-	39·42
Silicious residue	-	-	-	9·14
Oxide of iron	-	-	-	2·78
Copper	-	-	-	1·71
Oxide of zinc	-	-	-	28·82
Other matters	-	-	-	8·49
				100·00

24. The Committee consider that the other amalgams, such as gun metal, phosphor bronze, delta metal, and bell metal, are injurious in proportion to the amount of zinc in the mixture; and similarly that in the case of ordinary metal, the danger to the workers is proportionately increased by the use of improper ingredients, such as of used and discarded locomotive and marine boiler tubes, which are commonly coated with verdigris.

25. It has been clearly established to the satisfaction of the Committee that the symptoms commonly described as brass founders' ague are caused by these fumes of deflagrated zinc, owing to the inhalation of the fumes. And in cases where the food has been exposed to contamination by contact with the fumes, or where food has been taken during the process of pouring, by the introduction of the food into the digestive tract.

26. The Committee have further arrived at the conclusion that although in brass casting, as in all other occupations, the practice of personal cleanliness may serve to reduce the ill effects incident to the worker's employment, yet if a brass caster is constantly exposed to the

influence of these fumes, it remains almost an impossibility that he should pass unscathed by them.

27. The most serious efforts therefore should be directed by manufacturers and artisans alike towards the minimising of the ill effects which must of necessity be caused in the process of casting, by these fumes; and the Committee are convinced both from personal experience and from evidence which they have acquired from witnesses of all classes, that the directions of these efforts should lie towards securing a proper construction of casting shops, supplemented by a system of ventilation conducted on scientific principles.

28. It is not sufficient that a certain amount of cubic space should be afforded in each shop, as this may be wasted in unnecessary, and in even disadvantageous height, owing to which latter defect experience shows that fumes have not the opportunity of egress before commencing to redescend into the shop.

29. It is not sufficient to provide a large quantity of openings, or traps, or windows, at haphazard, with the idea that the more ventilation there is the better are the results attained, because these merely let in an undue amount of draught, which spoils the work, and is injurious to the health of the men, who become extremely heated in the process of their work.

30. A properly constructed casting shop should combine a due amount of superficial area for each worker, with a height suitable to the nature of the work carried on, and to the volume and character of the fumes usually thrown off. The ventilation should consist of apertures in the walls and roof of such a nature as to allow of the easy egress of the fumes; and of other apertures, such as doors and windows, which while being possibly closed during the process of pouring, can, at its conclusion, admit the air from various quarters, as the wind may suit, to drive the fumes upwards through the openings in the top of the shop.

31. And, as a general principle, a casting shop should not be constructed, nor any shop adapted to the purpose of casting, with another shop devoted to that or other purposes, above it. This form of construction results in (1) the ventilation of the lower shop being defective, (2) the penetration of fumes either through the floor, or through the windows (the latter being immediately over those in the casting shop below) into the upper shop, in which case the workers in the latter are often found to have suffered more from the fumes than the workers in the shop below.

32. The Committee have met with one notable case where shops have been thus built with other casting shops over them, and without any disadvantage arising; but in this case the ceiling of the bottom shop, and the floor of the top shop, were of concrete; and the shops had large ventilating shafts at the back, acting independently of each other. But their general experience has been that such a system of construction is unattended with proper ventilation, and they cannot report favourably respecting it.

33. Viewing the differences in the alloys, and in their methods of treatment, and in the size of the shops, and of the castings required, which the Committee have met with in different parts of the Kingdom, the Committee are unable to make any more detailed or precise recommendations on the subject of the construction and ventilation of casting shops than those contained in paragraphs 28 to 32.

34. They are, however, most deeply impressed with the evidence which they have received, touching the amount of illness caused by the existence of so many shops which can only be regarded as being totally unfit for the purpose to which they are put.

35. And they recommend, with the assent of every witness consulted on the point, that manufacturers and employers should be required to obtain from an authority appointed by the Secretary of State, a certificate of fitness for that purpose, of each room or place used by them for the casting of the metals included in the scope of this inquiry.

36. They are further of opinion that all casting shops, whether regarded as factories, or by reason of the subsidiary nature of the work carried on in them, as workshops, under the existing Factory Acts, should be cleaned down and limewashed not less than once in every nine months ; and that no exception should be extended to any portion of them by reason of their not possessing any glazed windows, a circumstance which affords an exception under the general regulations dealing with limewashing in factories. And that the dates of such limewashing should in all cases be entered by the occupier of the casting shop in a prescribed form of register.

37. The Committee have received a large amount of divergent evidence touching the personal precautions which might be deemed advisable or possible as likely to prevent or diminish the amount of illness complained of amongst the brass casters.

38. This description applies to the evidence received in connexion with the proposal that men should wear a respirator, or some form of covering for the mouth and nostrils when themselves engaged in pouring, or when working in a shop while pouring is in process. The Committee found that this was sometimes practised and more frequently only advocated, while they also received objections that the practice impeded breathing temporarily, and caused deeper inhalations of the fumes on the removal of the covering.

39. It further applies to evidence on the proposal that men should be induced, or required, to drink milk as an antidote. A great many witnesses considered milk to be a desirable thing to take when ill, but as a rule they preferred to take it at night, finding that it did not agree with them so well when taken in the shop.

In many cases evidence was received that from one cause or another, witnesses did not think milk suited them personally.

40. It also applies in the case of evidence as to the proposal that all persons should be disallowed from taking food in a casting shop. Much evidence was tendered as to the impossibility of casters always leaving the shops when desiring to take food, more especially in the case of strip casting, in which the process is more continuous than that which is customary in sand casting. The general conclusion formed from the evidence was in accordance with the feeling of the Committee, that the practice of taking food amidst surroundings which are undeniably unhealthy, should be discouraged.

41. And there was also much divergence in the evidence relating to the question of personal ablutions by the men before meals and before leaving the works, many casters preferring to defer these until they could perform them at home.

42. With regard to this class of remedies the Committee, bearing in mind that brass mixing and casting has been certified by the Secretary of State on May 11th, 1894, as a trade which in his opinion is dangerous or injurious to health, feel that a special rule should be made requiring manufacturers owning brass mixing or casting shops to provide, at the least, a basin, soap, and a supply of cold water for the purpose of personal ablution on the part of the men, as has been required to be done in the case of nearly all the other trades thus certified as unhealthy or dangerous. The Committee refrain from proposing a rule compelling the men to make use of these, not from any

feeling that pressure ought not to be put upon the men to use all means of cleanliness placed within their reach, but that they hesitate to propose any rules with respect to which they can suggest no adequate means of enforcement.

43. The Committee recommend that by a special rule applicable to mixing and casting shops, all persons should be prohibited from taking food in such places until the expiration of 10 minutes after the completion of the previous process of pouring therein.

44. Beyond expressing their belief in the desirability of casters and moulders wearing a covering over their mouths and nostrils while the process of pouring is going on, and also their opinion that, as a rule, milk when taken in moderation affords relief from the symptoms of the so-called "ague" (its chemical action being to form a harmless albuminate of zinc), the Committee have no observations to offer or suggestions to make respecting these proposed new remedies.

45. Returning to the other type of illness mentioned in paragraph 17 of this Report, and in which the respiratory organs are mainly affected, the Committee find that the inhalation of acid fumes, which is one principal cause of these symptoms, takes place in the dipping, and to a less extent in the bronzing processes; and that the inhalation of dust takes place in the different processes already discussed in the casting shop, and also in the polishing shop.

46. Dipping shops are required by the nature of the process carried on within them to be well ventilated, and they are found to be in most cases almost open sheds; the bad features existing in them consisting of the very wet condition of the floor. To remedy this the Committee strongly recommend that wooden stages should in all cases be provided on which the workers might stand.

47. The dust which arises in connexion with polishing is partly metallic in character, partly composed of a mixture of sand and of lime, and partly textile fluff worn off the calico polishing discs by the process of work.

48. Some of it, unlike the dust in a casting shop, is heavy and sticky, and, in the opinion of many experienced witnesses and of the Committee, it is quite as desirable, if not more so, that the workers in the polishing shop should have equal facilities for washing with those in the casting shop.

49. The lighter dust caused by each polishing disc (commonly called a "bob") should be driven out of the room, either by a well laid system of fans, or by elbow ventilators controlled by valves, and arranged to act according to the direction of the winds. With respect, however, to the adequate ventilation of all shops in which processes subsequent to that of dipping are carried on, the existing Factory Act Regulations are sufficient without the creation of any special rules; and the Committee therefore have only to invite the special attention of Her Majestys' Inspectors to the urgent necessity of bronzing, polishing, and lacquering shops receiving good and efficient ventilation.

50. Apart from the question of ventilation, the Committee found nothing in the processes of dressing or of lacquering requiring their attention.

51. They have found cases of women being employed in casting shops at core making, which is a special process in the preparation of the moulds in the case of hollow castings being required.

They are of opinion that employment of women in a casting shop, or in any portion of a casting shop which is not entirely separated by a partition extending from the floor to the ceiling should be absolutely

prohibited. This opinion has been shared by every witness consulted upon the subject.

52. In recapitulation, the Committee beg to recommend—

- (a.) That manufacturers should be required to obtain from an authority appointed by the Secretary of State, a certificate of the fitness of each brass casting shop used by them for mixing and casting purposes.
- (b.) That this necessity should come into force in the case of all existing casting shops within six months of the time of their examination by the said certifying authority.
- (c.) That all mixing and casting shops, whether regarded by the Factory Act as being factories or as workshops, should be cleaned down and limewashed once at least within every nine months, and that the dates of such washing should be duly recorded by the occupier in a prescribed register.
- (d.) That with regard to mixing and casting (which are at present certified as dangerous, or injurious occupations) special rules should be issued (1) requiring the provision of a basin, of soap, and of a supply of cold water; (2) forbidding food to be taken by any person within 10 minutes of the last occasion of pouring; (3) forbidding the employment within such shops of any female.
- (e.) That with regard to dipping shops, it is desirable that wooden stages should be provided for the dippers to stand upon.
- (f.) That without suggesting any rules dealing with such points binding on manufacturers or on artisans, the attention of both should be directed to the advantages arising from personal care on the part of the workmen. Instances of this being found in the wearing of a covering to the mouth and nostrils while pouring is in process; in the drinking of milk as an antidote to the poison of the zinc fumes; in the invariable exit from the casting shop for the purpose of taking food; in frequent ablutions; in care being taken to avoid cold; and in a regular and moderate diet. The Committee feel that by the observance of such habits of care the risks which must necessarily attach to a certain extent to the processes of brass mixing and casting may be materially diminished.
- (g.) That in the event of any special rules being issued having reference to casting shops, no exception therefrom should be extended to any shop by reason of the fact that the work carried on therein may be of a subsidiary nature only.

53. In making these proposals and recommendations the Committee feel and believe that they are proposing the minimum of obligation upon the manufacturers, and of restraint upon artisans, which the facts disclosed to them admit of. In proposing the compulsory provision of a basin, soap, and cold water for the casters, and possibly of others, they are asking for less than is already provided, under special rules, for workers in many trades. But the Committee go further than this, and ask for these provisions as being sanitary advantages in many ways as necessary, as those already provided by the Public Health Acts, for workers in all branches of trade. It may be the case that for some time the workpeople would not take full advantage of the benefits secured for them.

But the Committee are not only considering the present state of opinion of workpeople on this point. They desire to be instrumental in gradually educating the latter in habits of personal cleanliness while at their work; and as a sequence to this habit, of encouraging their sense

of self respect. And they venture to feel that manufacturers may not be indisposed to agree with them in this view of the matter.

54. And again with regard to the restriction which they propose to inflict upon casters in the matter of taking food while pouring is going on, the Committee are quite alive to the difficulty this may cause in large casting shops where pouring is almost continuous.

But the evidence which they have acquired leads them to believe that in the process of casting there is no reason, except the desire of the caster to get through his work rapidly, which is sufficient to detain him in the shop during his ordinary meal times; and they do not consider this desire as one which should be gratified to the detriment, at any rate, of the health of other workers than himself in the shop. The Committee are only inflicting the condition that if the casters desire not to leave the shop, they must not partake of food within reasonable time of the last occasion of pouring therein. The Committee wish to impress upon manufacturers the kindness and desirability of allowing the men to use some other room or place than the casting shop to take their meals in. They refrain from making any rule requiring manufacturers to provide any special mess room, from the feeling that such a rule could only be advantageously carried out in places where its requirement was the least.

55. With regard to the proposed examination and granting of certificates in respect of the fitness of casting shops, the Committee are fortified in their opinion and recommendation by the evidence of every factory inspector, manufacturer, and artisan whom they have consulted upon the subject. They believe this proposal to be the crucial point of their Report. The brass trade is one of the largest and most important industries in the Kingdom; and the welfare of the most important class of its operatives depends almost entirely upon their work being carried on in surroundings as healthy as experience can devise and procure.

Great improvement has been brought about of late years by many manufacturers; but there still remains a large number of shops which may veritably be called "death traps," and it is to the improvement, or if necessary to the removal, of these, and to the prevention of any such being in future erected, or adapted to the purpose of casting, that the efforts of the proposed licensing authority would be directed; with advantage to the workers, and with no less advantage to manufacturers, and to the brass trade at large.

56. In conclusion the Committee beg to return their most hearty expressions of gratitude for the assistance so frankly and courteously extended to them during the progress of their inquiry by the manufacturers and artisans in the districts they were able to visit; and they trust that to them and to their comrades in other parts of the Kingdom the work which has caused each member of the Committee very deep interest in performing may not be unattended with lasting benefit.

W. M. DAWKINS CRAMP,
Chairman.

ROBERT M. SIMON.

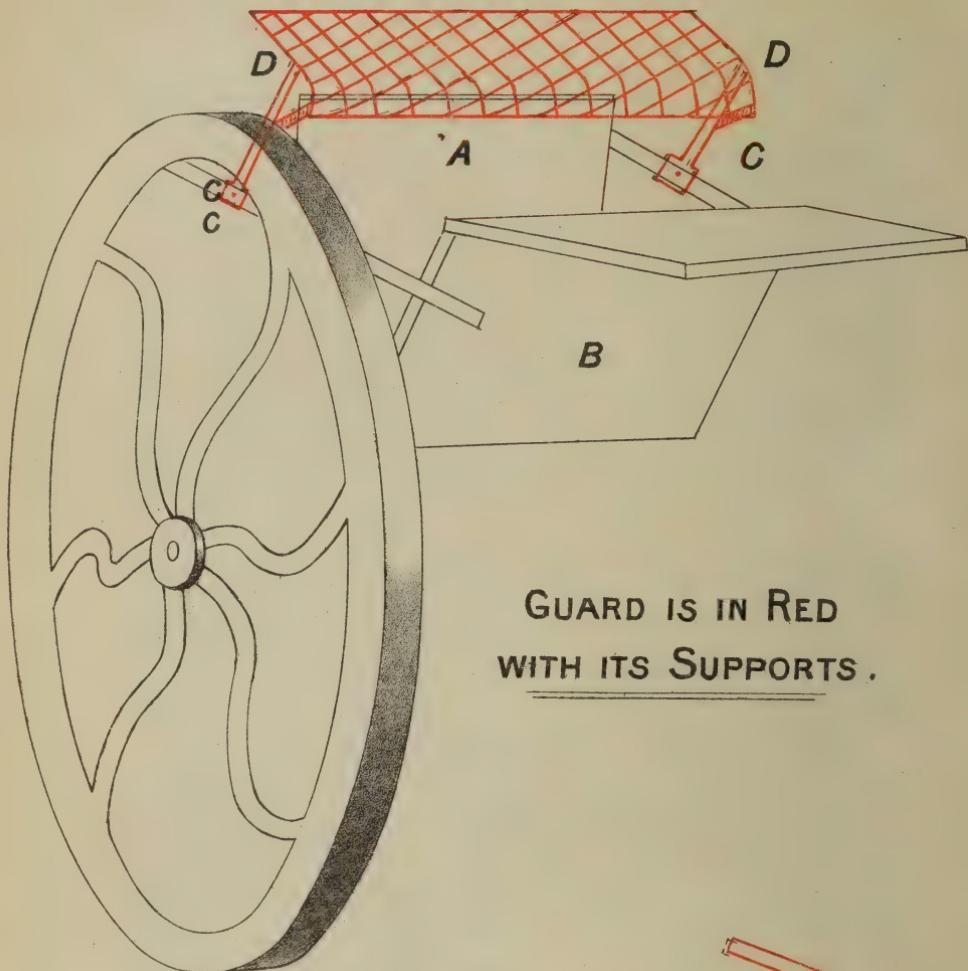
W. R. LANE.

W. J. DAVIS.

S. H. KNYVETT,
Secretary.

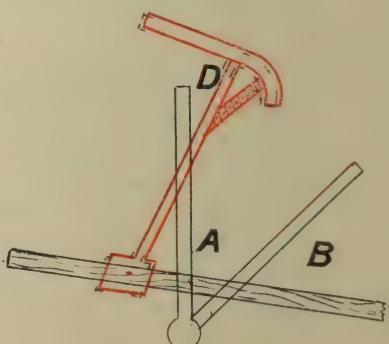
The non-official members of the Brass Trades Committee desire to add to the foregoing Report a strong expression of opinion that in the event of the carrying into effect of the recommendations which have

Major Roe's Report.



**GUARD IS IN RED
WITH ITS SUPPORTS.**

- A .** Is the Platen .
- B .** Is the moving Table .
- C.C.** The usual side bars to machines .
- D.D.** Supports to Guard & Springs .



**SIDE ELEVATION OF
PLATEN PRESS & GUARD**

been made for the granting of certificates to the owners and occupiers of casting shops, such a responsibility as would be involved (1) in passing existing shops; (2) in advising the needful alterations of those shops at present considered unsuitable; and (3) in suggesting methods of construction of shops about to be erected should not be delegated to the ordinary staff of factory inspectors, but that this important work should be placed under the supervision and control of an official specially appointed, who should be able to devote to it his whole time and energies.

That such official should have intimate knowledge of the requirements of the trade, and be a gentleman who would secure the confidence of manufacturers and of workmen, and thus facilitate the efficient carrying out, without undue friction, of what they believe to be most desirable legislative requirements.

ROBERT M. SIMON.

W. R. LANE.

W. J. DAVIS.

ACCIDENTS, AND FENCING OF DANGEROUS MACHINERY.

Major Roe, H.M. Inspector for a portion of the Birmingham district, remarks:—

"I have had some distressing accidents from platen printing presses, both those worked by power and by hand, and having ascertained from the Superintending Inspector that there was no known guard anywhere in use for these machines, and that accidents from them were numerous, I made an appointment with the maker of the Arab press, and gave him my ideas of a simple guard which I thought could be used, but he, after saying he had had the matter often pressed on him, wrote some fortnight afterwards that, 'The man is not living that can invent a ' prevention of accidents on platen machines. We ardently wish we ' could, &c., &c.' However, having shown my plan to several printers, one of them, Mr. S. Bulford, said he would get one made to my drawings, and after some trials he has succeeded, and I believe this pattern of guard is well adapted to the purpose, and I attach a sketch of it; he is having it made, and it will shortly be ready for sale, and I hope general adoption in the printing trade. It is simple and will be inexpensive, and can be readily fixed by two screws to most, if not all, of these machines, as it will be made in the three widths of machines.

"The accompanying sketch is from a photograph, but I have left out for clearness sake many details not required. The guard (in red ink) consists of an iron frame covered with strong wire netting, and is supported in position by two upright bars, DD, which are attached by screws to CC of the machine. The guard is pivotted or socketed at the top of these supports to allow of a little upwards play of the guard, which is kept in position by spiral springs.

"To make it clear I give a sketch of side elevation of platen, table, and guard. The front edge of guard exactly meets the top of table as it closes to take the impression, and it projects some 5 or 6 inches in front of the top of the platen.

"The action of the guard is this, should any person allow hand or arm to remain between the table and platen as they close together, the fingers or hand would be held back by the front edge of the guard, and possibly slightly pinched, but (owing to the slight upwards play of

the guard) if held, easily withdrawn on the worker feeling his hand interfered with.

"I have seen it in use and it answers admirably and does not obstruct the worker.

"As these accidents are numerous both by power and hand machines (the latter hitherto seldom coming to our knowledge), generally serious, and sometimes have resulted fatally, I believe this guard will be welcomed by the trade, and being attachable to any machine, and at a cost of a few shillings, it should be largely utilised.

"There have been two accidents in my district from the bursting of emery wheels during the year. To one I need not further refer than to say it was undoubtedly broken by being driven too rapidly, but the other has features which it would be as well to refer to. This wheel was 20 inches diameter by 2 inches thick, mounted between side plates only 5 inches in diameter. It was not being driven at a very excessive speed, as far as I could ascertain (830 revolutions a minute, 800 being the proper speed of such a wheel, by the tables of Messrs. Bateman and Co., Limited), and had been in use some 10 days. Owing to the nature of the work the wheel was worn down or bevelled on one side about half an inch more than the other. The guard, or rest, was attached to the side frame of the machine and could only be adjusted to the surface of the wheel in one direction, and therefore could not be adjusted close to the cutting surface, owing to the beveling. The man working it was polishing a stud of an iron safe, a small piece of metal.

"In the absence of any evidence pointing to a blow or excessive speed of the wheel, I can only conclude that the man lost hold of the stud, which jammed in the opening between the guard, or rest, and the wheel and this caused the breaking of the wheel. I report this to point out the necessity of a properly constructed guard to all emery wheels, which should be adjustable to fit closely the cutting surface of the wheels.

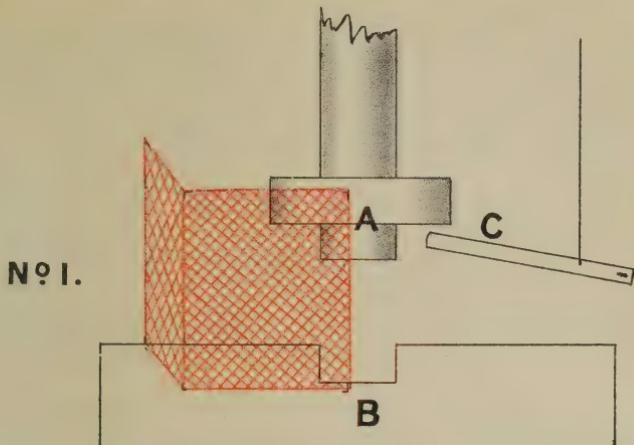
"I consider, further, that emery wheels should not be permitted to be placed in positions where (such as the middle of shops in which others are at work) if they break the flying pieces would probably cause injury to others besides the actual grinder.

"*Power Presses.*—By a recent decision of the Court of Queen's Bench the dies of power presses are declared to come under the category of 'dangerous machinery.' Some years ago I paid much attention to these machines, which I found generally worked or set in motion by means of a treadle. I ascertained from some large makers of the machines that the *treadle* can always be replaced by a *hand lever*, and that as one hand is necessary to work this lever at each stroke (when the machine is not one which works continuously) the danger of an accident is at once reduced 50 per cent. I induced the principal users of such machines in my district to alter them from treadles to hand levers, and where possible to put a guard, or shield, on one side, to prevent more than one hand being under the die at a time. I believe many accidents have thus been avoided.

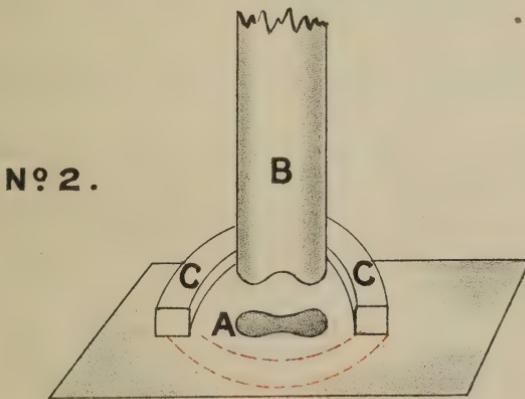
"The accompanying sketch, No. 1, will show the arrangement, and where in use the workpeople like it, for it does not decrease the output of the worker.

"The worker has his material at his left hand, passes it to his right and places it under the die, draws back his hand to the lever, and sets the machine in motion. As the die withdraws he takes or pushes out his work. (Some work *must* be carefully taken out by hand; in cases where several thicknesses of metal are pressed together, and if disturbed would not fit, such as two hemispheres to form a ball.) In cutting out

GUARD FOR POWER PRESSES.



- A Is moving Upper Die.
- B Fixed Bottom do.
- C Lever Arm to work machine.
The Shield is in Red Ink.



- A. Lower Plate or Die, with opening for work.
- B. Upper Die.
- C.C. "Puller off" of iron, fixed so as to allow the sheet of metal to be cut to pass underneath it and over the lower plate, this acts as a guard to a great extent and if extended round in front, as shown by the dotted red lines, is a good one and does not hamper the worker.

presses the machine often acts continuously, stroke after stroke, until stopped, and such machines can be easily guarded. Some are fitted with what is called a 'puller off,' as the sketch No. 2 shows.

"There are many other contrivances in use, one manufacturer has shown me a large cupboard full of tin guards adapted to every style of work he does by presses, and a guard adapted to one class of work will not always do for another.

"*Accidents.*—The accidents during the last 12 months have slightly decreased in my district, from 128 to 110, notwithstanding the undoubted increase in manufacturing, owing to better trade.

"But four proved fatal. One of these was from a hoist, which being fenced merely by bars, the injured lad was not prevented from stooping under the bars, jumping on to the top of the cage as it was descending, and thence being thrown on to his head on to the floor.

"Two other less serious accidents have occurred from hoists merely fenced by bars, and I strongly urge that rails alone are insufficient as guards to hoists, and I have had sliding doors or gates erected in lieu of rails as far as possible.

"I was subpoenaed in a case under the Employer's Liability Act as a witness, in which a man sought to recover damages for injuries from a chocolate grinding machine. There was a loose pulley to the machine but no fork to work the belt from the fast to loose pulleys. The injured man stopped the machine and tried to move a wooden block near the rolls, and the machine restarted, probably by the belt working itself on to the fast pulley. I have caused a fork and pin to be applied to the machine. The jury disagreed, so the trial came to nought. But I consider the accident should not have occurred, and hope that section 4 of the recent Act will enable us to cause forks, and pins to hold the forks in position, to be fitted to all machines such as are so started into motion."

Mr. Crabtree, H.M. Junior Inspector for Birmingham, observes:—

"I am pleased to notice an increasing desire to obey the requirements of the Act as to fencing of mill-gearing and machinery. It is very rare indeed that I find any dangerous part of an engine unfenced; in fact, there appears to be a sort of rivalry among the better class firms in the adoption of most protective and substantial fencing arrangements; and some have, I know, gone to considerable expense in carrying out their plans. This I consider one of the best features of our present factory life. When a man carries on his work with knowledge of his personal safety, his work is improved not depleted. I have in many cases advised the abolition of what I considered 'traps' rather than fences. Here is a case in point: I recently visited an important nail factory in Birmingham; with the machine fences I found no fault, but by closely investigating the dark, cellar-like engine-room with its contents I found such a trap. A 12 feet fly-wheel was 'fenced' on one-half of its face by a fragile wooden rod about 2 feet above the edge of the wheel-race. In my opinion no such fragile stick should be tolerated as a protective close to a fly-wheel. If an engineer should slip and come in contact with such a 'fence' the consequences are easily foreseen. Happily such 'traps' are rare.

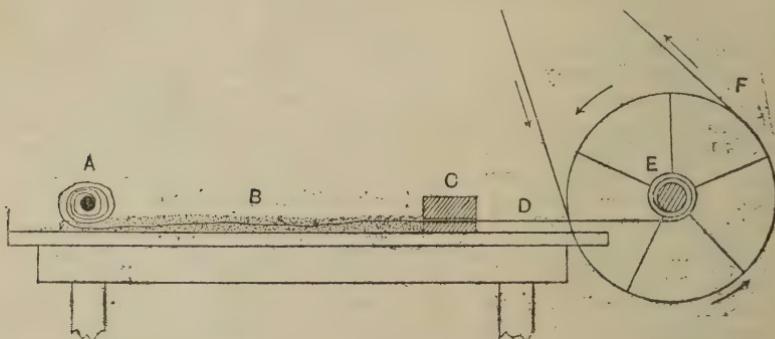
"During the year there has been an increase in the number of gas engines used, and in some factories these have supplanted the former steam engines, much to the advantage of the employers. The dangers

attendant on the use of gas engines are, of course, not so great as with steam engines, but the former, nevertheless, need care in the matter of fencing. I am frequently receiving this question : 'If I put a rail in front, will it do ?' and I am, almost invariably, in duty bound to say 'No.' The question shows a feature of a bye-gone day, when men put up as little fencing as they could nominally to keep the letter of the law, but totally regardless of the protection needed. I maintain that it will *not* do to leave either the upper or lower half of a fly-wheel face unprotected, for what does a rail across the middle do, more than screen but a very small portion of the wheel ? To meet the case I have advised the adoption of a simple plan, which, though not new, might be more extensively adopted at very little cost.

"In Birmingham it is the custom of the engineer to start the fly-wheel by hand, taking hold of the spokes of the wheel and moving past the first 'explosion.' Automatic starters are to be found here and there among the larger firms, but the more insignificant do not readily take to these very useful devices and believe there is nothing like 'whirling the wheel round.' I hope to be able to convince these of the great advantage of some of the starting handles which have recently been made for the purpose. But whether these men will adopt a handle or not, I will insist on the fencing of the wheel-face. I advise a couple of poles to be driven clear of the periphery of the wheel, on each pole is one or two hangers, a piece of strong rhomboidal wire netting of suitable size is obtained, and an iron rod selvage attached. The fence is ready for immediate use; it may be placed on the hangers and removed as required, and it is completely protective. Furthermore, it may be placed close to the spindle, or, if the spindle be capped, close to the wheel itself.

"The accompanying sketch will illustrate :—

"Another matter which I would desire to mention has reference to cleaning machines in rolling mills. Two very serious accidents which happened during the past year on these machines assure me that there is ample room for thought in regard to their safety. The enclosed sketch will show the *modus operandi* of these machines.



A = loose coil of brass which is to be cleaned.

B = the brass passing through sawdust.

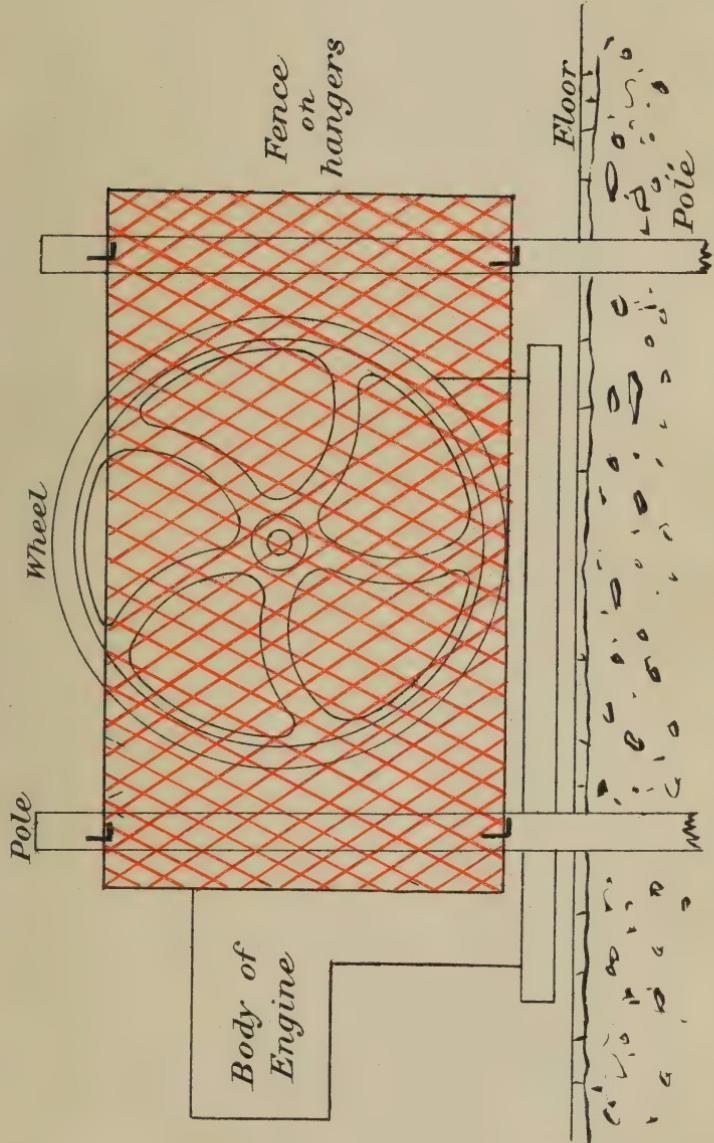
C = a weight covered with sacking which here clears off all sawdust.

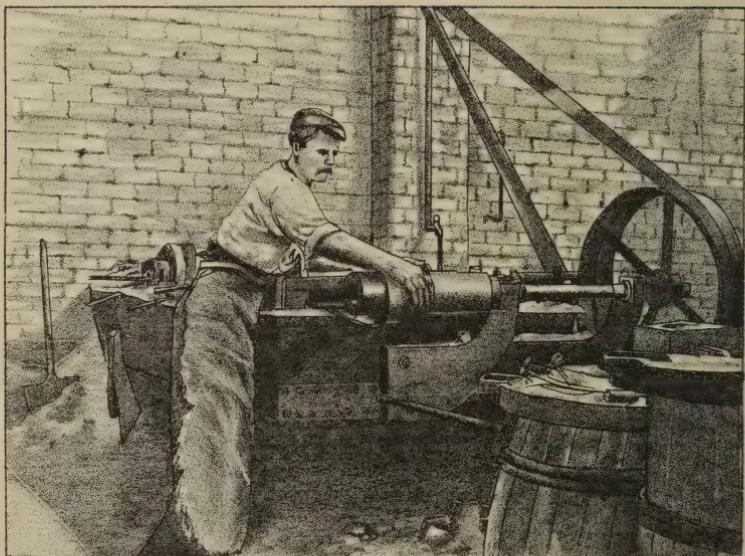
D = place where workman dries the *upper* side of the brass into a piece of waste in his left hand.

E = roller to which coil is attached ; the workman here dries the *under* side of the brass with a piece of waste in his right hand.

F = driving pulley connected with overhead shaft ; and loose pulley on which strap may be thrown by a sliding rod and fork.

FENCING OF FLY WHEEL OF ENGINE





CLEANING MACHINE IN ROLLING MILLS.

In order more clearly to show the machine in its entirety, I enclose a photograph showing the workman attaching the beginning of the brass coil to the roller ready to 'set on.'

"Now, sir, I feel sure it will be obvious that such an arrangement is fraught with danger, and this probability has had its demonstration in terrible fact. With two such machines have workmen been badly and almost fatally injured. In one case a man's right arm got into the gathering-in point on the roller E and was crushed and twisted off above the elbow. Fortunately his employer was present, and with commendable precision applied 'first aid' principles in the shape of a tourniquet near the armpit, which checked the bleeding, till the injured man could be got to the hospital, two miles away. In the other case, a man's waste was wrapped round his fingers, the waste caught in the gathering-in point of the roller; his fingers and arm were drawn in and smashed before help could be got and the machine stopped. Other similar cases have been mentioned to me.

"I sincerely hope that engineers and machinists may see their way to some better and safer plan where men's hands may not be in any way involved in the moving parts of the machinery. That this is possible I have, in my own mind, ample evidence. Very recently I have inspected a Birmingham rolling-mill in which a cleaning machine is used which does its work automatically. The workman simply attaches the coil to the roller, and the brass is cleaned and dried throughout without any interference. As it is a machine invented by the firm and regarded as strictly private I am debarred from particularising.

"I regret to have again to record misfortune from under-bench shafting, though I believe much has been done of late to obviate accidents from this cause. Strangely enough the fatal case which I investigated was one where the shaft was fairly well fenced by an 8 inch horizontal board extending in front of and parallel with it. The victim of the accident—a boy of 15—was requested by his foreman to clean the shop and pick up bits of brass from the floor; but, of course, the said foreman in no way intimated that he was to go under the bench or to approach the shaft. The boy set to work with a hand brush and espied a piece of brass on the floor immediately behind and under the shaft. He leant over the wooden fence, which was nailed mid-way between the bench and the floor, and was in the act of reaching the piece of brass when his apron was caught under his armpit by one of the three projecting bolt heads of a coupling on the shaft. He was whirled round between the shaft and the floor, and the fence was broken to splinters. I went the following morning and found the boy's clothing exactly as it had been entangled. By the aid of a candle I traced its complicated foldings, and ultimately reached the starting point of the accident—about $\frac{1}{8}$ of an inch of the edge of the apron was tightly fastened round the bolt-head above mentioned. Since then the employer has re-fenced the shaft by horizontal boards in front of the benches and riveted troughs over the shafts. Not infrequently employers express surprise at my determination to have portions of low shafting fenced, and regard the low pulleys and bands as being the most fruitful sources of accident. I strive promptly to rid them of this fancy by a quotation or two from experience. This is generally sufficient when coupled with circular I. I do not exempt low pulleys and bands from the necessity of fencing, and find them generally well attended to. A little while ago a very good arrangement was shown to me. The employer kindly permitted me to take a photograph of it, and I beg to submit it to you. From this it will be seen that the shaft, though well to the back, is

fenced by a stout board, and the pulleys are guarded by a small door which is hinged under the bench and cannot be raised unless lifted and held by the workman. It cannot be taken from its place ; it cannot be kept up. Immediately he lets it go, down it falls to the place assigned to it. As a rule, these underbench shafts in polishing shops belonging to the larger firms are boarded off entirely from bench to flooring.

"I am able to record closer attention to the cogs of lathes. The lathe in Birmingham is a *sine qua non*, and probably occupies the premier position among its machines. It is therefore essential that its safety should be ensured. I occasionally meet with the old story that these cogs have to be 'changed so often' that a fence would be a nuisance instead of a help ; but I assure my friend that this statement is much behind the times ; that a fence can be made, and the same can be attached in a moment without the slightest hindrance to the worker. I show him my book of sketches and convince him that it has been done, and therefore can be done again. I submit to you a view of a guard for change wheels which answers to this description. The end plate is cut to shape and the edge plate is riveted thereto ; two pegs are driven through the top of the guard. These drop into the bearing at the top of the lathe, and the cogs are well protected. The photograph shows one guard on the end of the lathe and the interior of another guard by its side."

Capt. Smith, R.N., H.M. Inspector for the Sheffield district, remarks :—

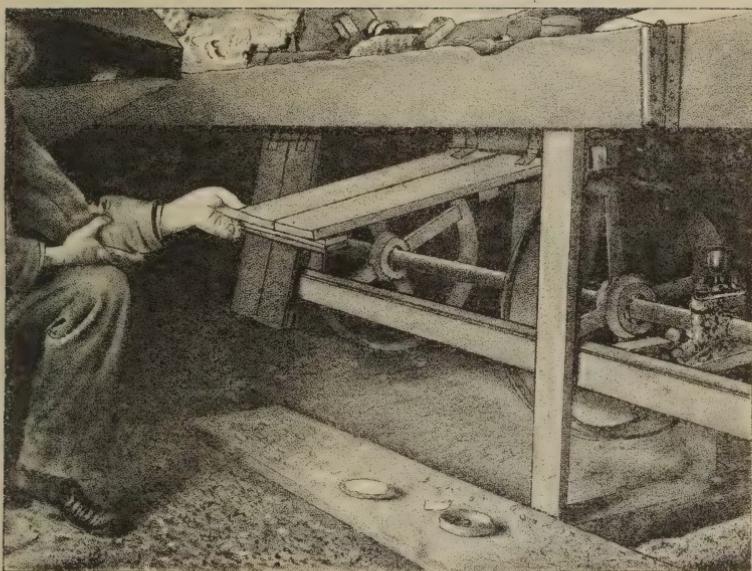
"When visiting at the small village of Laceby in Lincolnshire I noticed what seemed to me a good saw guard. The patentee, Mr. John Drury, has sent me the specification now enclosed, it will be noted that the date in 1884, but it is an open question whether more modern inventions have improved on Mr. Drury's design.

"This invention relates to improvements in guards for circular saws, the object of the invention being to provide a guard which will effectually prevent any person from being caught by the teeth of the saw when working and which will also prevent anything being thrown from the back of the saw against the workman ; the guard is automatic in its action and can easily be adjusted to existing saw benches.

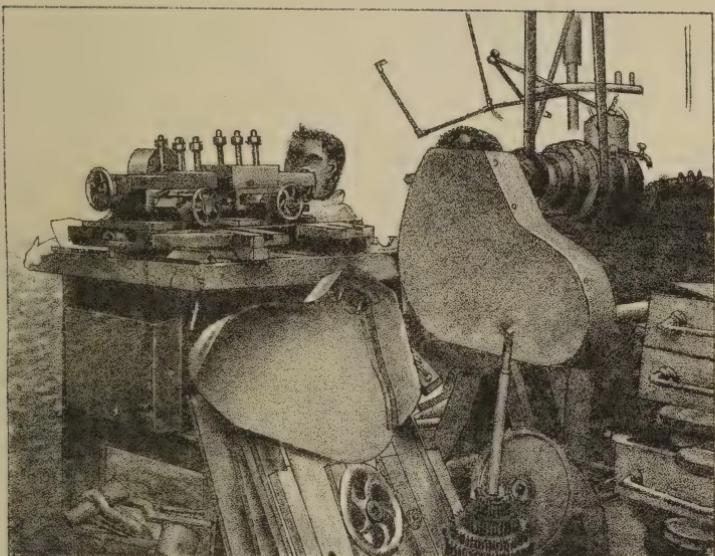
"My improved self-acting guard is constructed of two curved arms hollow or grooved on their undersides and extending over the circumference of the saw above the bench ; the said arms are pivotted to a bar or carrier having a sliding vertical motion on a standard bolted to the saw bench, the said sliding motion being communicated by means of a screw and a hand wheel ; the said bracket also carries two pendent arms, one hanging on each side of the saw, and capable of partial rotation round the said bracket.

"In order to enable my invention to be fully understood I will describe the same by reference to the accompanying drawing, in which figure 1 is a plan, and figure 2 an end view of a circular saw bench and saw with my improved guard applied thereto ; Figure 3 is a section on line A B of Figure 1 ; Figure 4 is a front elevation showing the position occupied by the parts forming the guard when a piece of wood is being cut by the saw. Similar letters in all the figures represent similar parts.

"*a* and *b* are the two curved arms formed hollow or grooved on their undersides as shown at figure 2, so as to cover or shield the teeth of the saw *c* ; the arms *a* and *b* extend over the circumference of the saw above the bench *d*, as shown, and are suitably curved so as to yield to



FENCES TO UNDER-BENCH SHAFT AND PULLEYS IN METAL POLISHING ROOM.



FENCE TO CHANGE WHEELS OF LATHE.

Captain Smith's report.

FIG. 3.

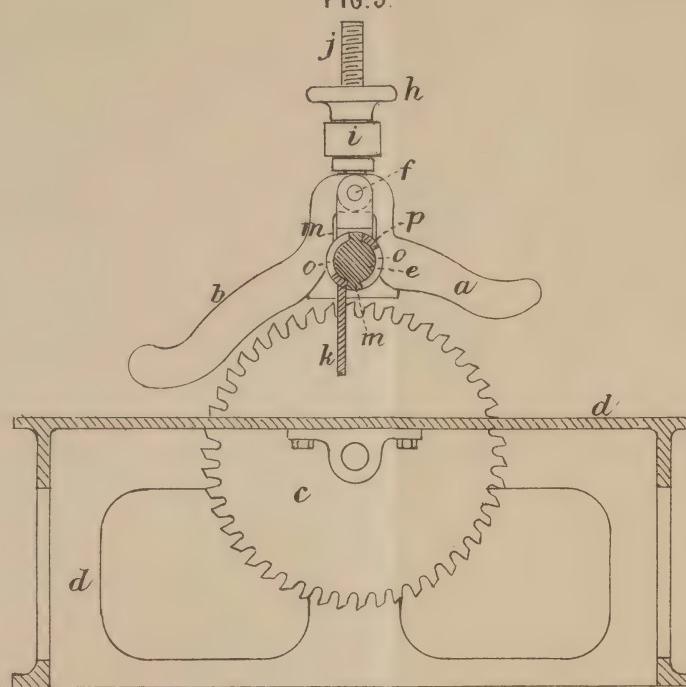


FIG. 4.

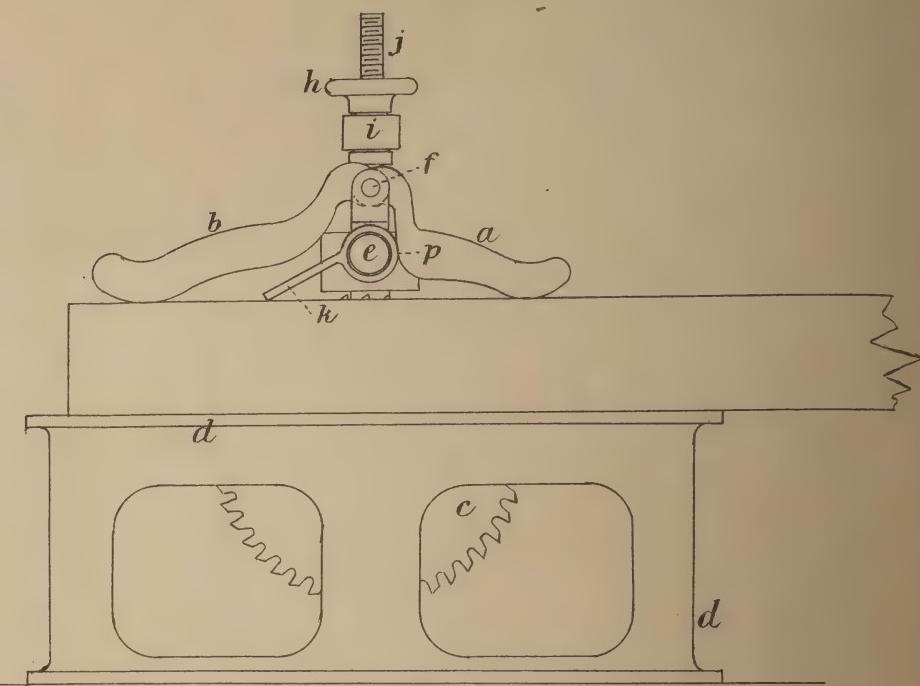


FIG. 1.

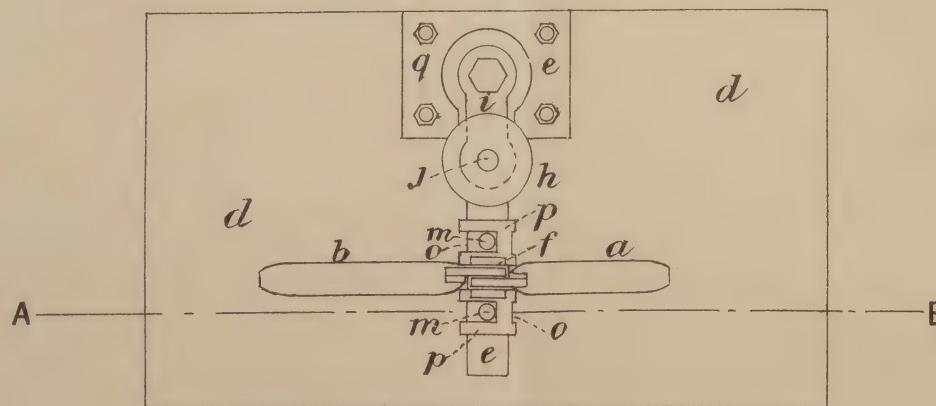
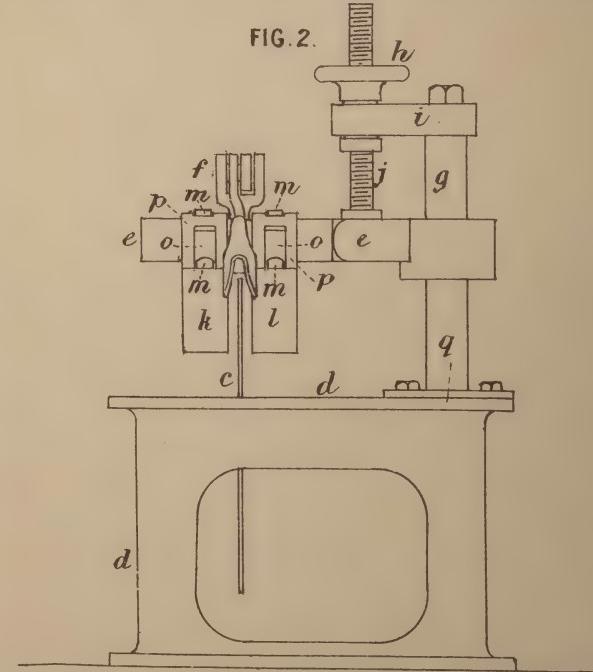


FIG. 2.



the pieces of wood as they are pressed against the saw ; *e* is the bar or carrier on one end of which the arms *a* and *b* are pivotted at *f* and which forms a stop against which the arms bear when in their normal position and whereby their downward movement is limited ; the other end of the carrier *e* slides vertically upon the standard *g*, its movement being effected by operating the hand wheel *h*, which turns loosely in the bracket or arm *i*, and through which passes the vertical screw *j* ; by these means the height of the guard can be regulated according to the work and to suit different sizes of saws ; the standard or upright *g* is fixed to the saw bench *d* in any suitable manner such as by screw bolts and nuts passing through the base plate *q*, as shown ; *k* and *l* are the two pendent arms hanging one on each side of the saw *c* and capable of partial rotation round the carrier *e*, so that they will yield to pressure in one direction but will remain rigid when pressed in the opposite direction, their movement being limited by pins or stops *m*, on the carrier *e*, over which pins or stops pass the slots *o*, in the collars *p*, of the arms *k* and *l* ; these arms which hang vertically downwards when in their normal position, as in figure 3, prevent any wood or the like from being thrown from the back of the saw towards the workman as they will only yield to pressure in a direction towards the back of the saw.

“ By these improvements it will be seen that when no work is being performed by the saw and the parts of the guard are consequently in their normal position as shown in figures 1, 2, and 3, the arms *a* and *b* will shield the teeth of the upper half of the saw and prevent anything being caught by the saw teeth and damage being done to a person or article which might fall against or over the saw, and the arms *k* and *l* will form a stop to anything which may be thrown forward by the saw towards the workman. The curved shape of the arms *a* and *b* will allow them to yield and give passage to the pieces of wood as they are passed over the bench when being cut by the saw ; the arms *k* and *l* also give way to the wood and both sets of arms rest upon the wood as seen in figure 4 until it is cut through by the saw, when they automatically fall into their normal position or position of safety, as shown in figures 1, 2, and 3. The improved guard can with facility be fixed to any existing circular saw bench, it only being necessary to bolt the plate *q* to the bench, as shown in the drawing.

“ Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed I declare that what I claim is :—

“ Firstly. The combination of parts forming the improved guard for circular saws as herein-before described and represented in the accompanying drawing.

“ Secondly. In a guard for circular saws the combination with the pivotted arms *a* and *b*, of the sliding carrier *e*, and pendent arms *k* and *l*, capable of partial rotation round the said carrier all arranged and operating substantially in the manner and for the purposes herein-before described and represented in the accompanying drawing.

“ Thirdly. In a guard for circular saws the employment of arms or shields grooved on their undersides and suitably curved as and for the purposes herein-before described and represented in the accompanying drawing.

“ Fourthly. In a guard for circular saws the employment of pendent arms capable of partial rotation so as to yield to pressure in one direction but which will resist pressure in the other direction substantially as and for the purposes herein-before described and represented in the accompanying drawing.

"I enclose also a drawing of a good saw guard sent me by the well known firm of Marshall, Sons, and Co., of Gainsborough."

Mr. Hoare, who has recently taken the inspection of the Norwich district, observes :—

"Accidents appear to be very few in this district. I have no reliable figures to compare them with for former years. They have during the six months been almost entirely of a trifling character. There has only been one fatal one, a man fell down a ladder or rather two ladders, in a windmill. The ladders were in bad repair, but he may, in a doctor's opinion, have had a fit."

Mr. R. Johnson remarks with reference to the Newcastle-on-Tyne district :—

"There have been 73 fatal accidents in this district during the last year, viz. :—

Falls chiefly on shipbuilding	-	-	-	30
Burns	-	-	-	7
Locomotives and waggons	-	-	-	9
Cranes	-	-	-	7
Fly wheels	-	-	-	2
Fall of scaffold	-	-	-	3
Explosion	-	-	-	1
Miscellaneous	-	-	-	14
				—
Total fatal	-	-	-	73
				—
Minor accidents	-	-	-	673

"This would appear to be a very large increase of accidents over last year, but such is not the case. I believe the increase is due entirely to the occupiers being more careful in reporting.

"Two very serious accidents have occurred which would merit attention from the extent of damage done and their somewhat regular character.

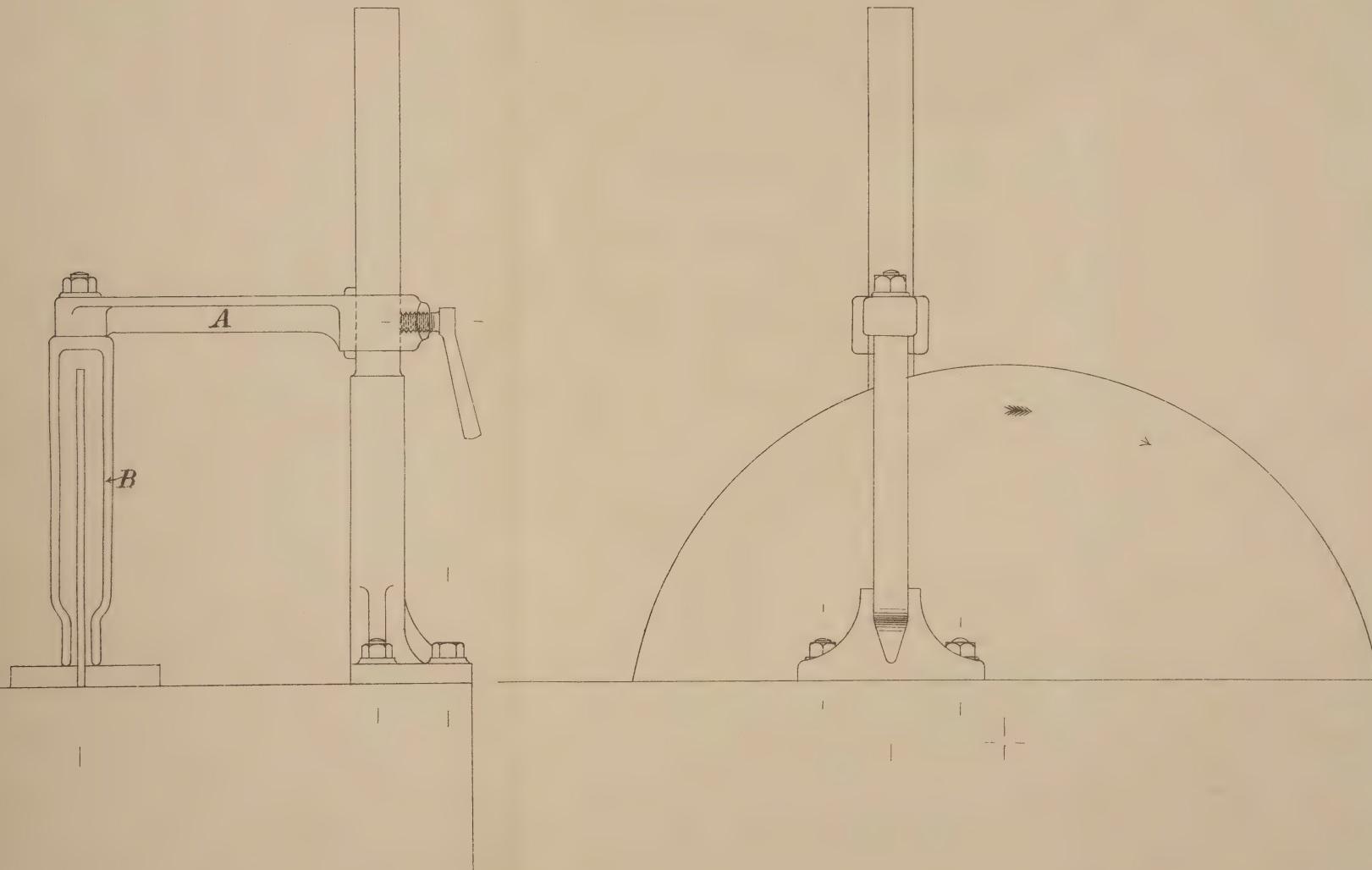
"A party of four men were repairing the inside of an iron furnace chimney by means of a scaffold suspended by ropes about 80 feet from the ground, in the interior of the chimney. There was a hole left in the middle of the scaffold for hoisting material through and for the purpose of ascent and descent of men who reached the scaffold by means of ladders. The scaffold being a loose fit in the chimney, the men drove wood wedges point downwards to steady it. They left it wedged one night, the night was very wet, and the well-known action of water upon ropes caused such a strain as to imperceptibly fracture them. The men got on to the scaffold the following morning, when the ropes, new ones, parted, and three of the four fell with the scaffold and were killed. Another very serious accident by which five men were burned to death occurred at a blast furnace which had been blown out for repairs. It is usual to allow about a week for cooling the interior by means of water, before taking the bottom walls of furnace. In this case the operation was done too quickly and whilst a number of men were standing round the furnace bottom a huge fall of hot debris fell and caused the death of five men."

Mr. Jackson, H.M. Junior Inspector for Liverpool District, reports :—

"During the past year I have made special inquiries into the guarding of circular saws, but must confess that, while strongly opposed to these

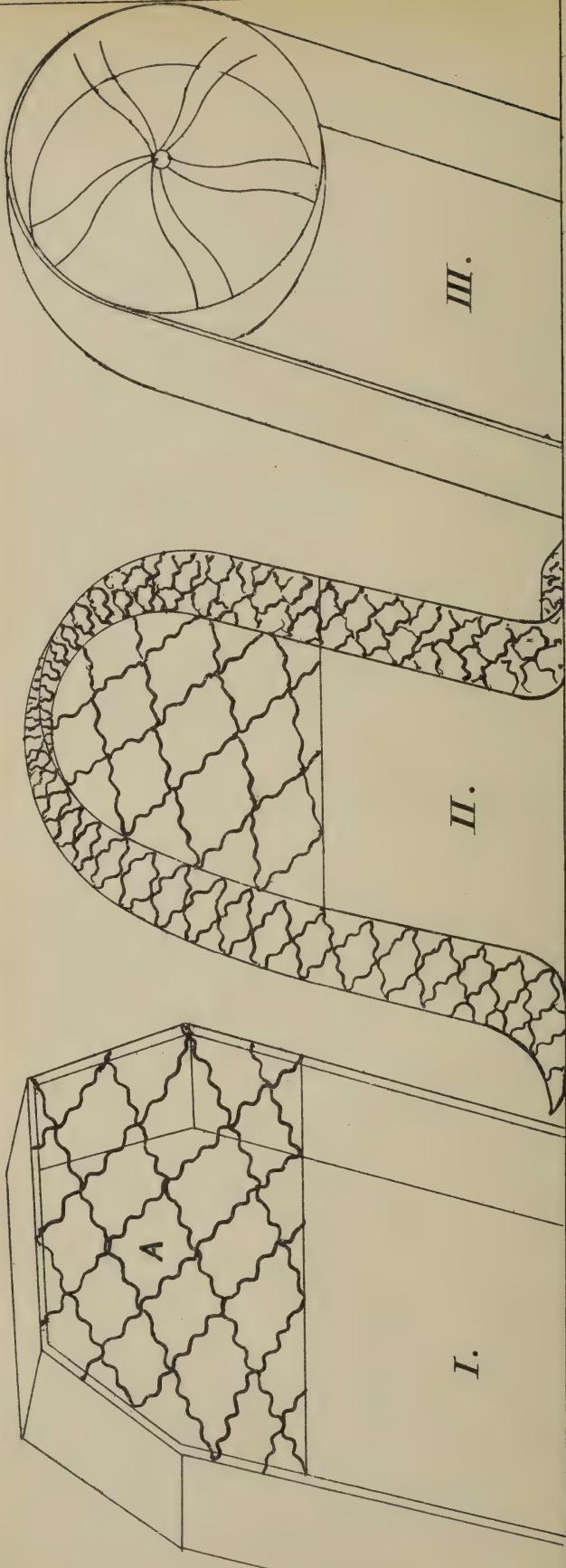
Captⁿ Smith's Report.

GUARD FOR CIRCULAR SAW.



THE APPARATUS consists of a Pillar, on which the Arm "A" slides up & down to suit the various thicknesses of wood required to be cut. "B" is a wrot: iron Fork embracing the saw, & prevents the timber from flying up, if caught by the saw.

GUARDS FOR ROLLER-MILL ENDS IN CORN MILLS.



I. Wooden frame, with detachable woven wire front "A".

II. All woven wire on strong wire frame.

III. The pulley on end of Roller-mill, to be guarded.

dangerous machines being unguarded, I am unable to say that a guard which will be at once safe and not interfere with the work, and, *most important of all*, meet with anything like general approval from the sawyers themselves, has yet been found. I have generally made a point of asking the workmen themselves which kind of guard they approve, and the answer is almost always "None."

"Of the guards in use, Mr. Lakeman's (or some adaptation of it), or the one made by suspending a piece of board over the middle of the saw and at right angles to it, are the most common. Concerning the former, one great objection made by the men is the trouble of moving the guard to change the saw, and by some of them also of it interrupting their view of the work. One firm here has adopted a rather different plan of fixing the guard in order to meet these objections as far as possible. It consists of the usual piece of semi-circular iron, which forms the guard, over the saw, but this is fastened to a piece of one-inch square-iron some four or five feet long. The square-iron passes through two guides fixed to the wall at the back of the saw bench, which makes it rigid and keeps it from turning round. To the top of this square-iron is fastened a rope (passing over a pulley) and balance weight. Care is taken to get the balance correctly adjusted and then the guard can be raised by a simple pressure up or down.

"Dealing with the second of the guards referred to, if the board is simply suspended by cords it is of no use except for very light work and also to keep the dust from flying back into the man's face; but if it is firmly fixed, either in a slide or in a manner somewhat similar to that referred to above, it forms a cheap and efficient fence for the saw.

"The objection of the men to use the guards was shown in a recent visit I paid to a saw mill where the firm had some time ago gone to the expense of a 'Lakeman' guard. I asked to see it and found the sawyer had taken it off and there it lay a heap of, apparently, old iron, in a corner under the saw bench.

"I have had considerable difficulty with flour mills in enforcing the fencing of machinery, and in two cases a prosecution followed my report. I find the underground shafting is frequently left unguarded, and that men are allowed to go inside the guards (where they have been fixed) and brush the floors, &c., while the machinery is in motion. The driving pulleys and belts on the roller-mill ends are also frequently left unguarded. One firm here has adopted a wire guard, which I think very successful. It consists of either a wooden or strong-woven wire-guard over the strap and top of the pulley, the spokes of the pulley being protected by a separate piece of wire-netting which is made to easily take on and off, and as it does not come below the bottom of the pulley leaves room for sweeping the floor between the belt. See accompanying sketch.

"The greatest difficulty regarding fencing, especially of low pulleys and shafting, occurs in old mills that have been converted from the old stones to the newer roller process. The use of trap doors in the floors is also a source of danger, the workpeople being very careless about closing them. In order to secure the closing of these doors a firm in Birkenhead have a tort rope attached from the floor to the ceiling just at the back of each door. This has the effect of a spring, as the doors fly open when a bag is drawn up and, rebounding off the rope, shut as soon as clear of the bag. Further if they should remain open they are standing up and in that position not only attract attention to the fact of their being open, but also prevent anyone 'tripping' over them, which often occurs when lying down flat on the floor of the room."

Mr. Bellhouse, H.M. Inspector for the Dublin District, observes :—

"I am glad to be able to report a considerable reduction in the number of accidents that have been reported to me. Last year there were in all 172 reported. This year the number has been reduced to 118. I regret to say that of this number 12 have proved fatal. These may be classified as follows :—

- "(1.) One man killed by imperfectly guarded water wheel.
- "(2.) One man and one woman killed by being caught in rollers in scutch mills.
- "(3.) Man killed by getting caught in the back of beetling engine.
- "(4.) Two men killed by inhaling poisonous fumes; one in a gas works, and the other in a chemical manure factory.
- "(5.) One man smothered in a malt bin.
- "(6.) Two men killed by falls; one from a wall, and the other from a cart.
- "(7.) One man killed by bursting of a separator in a butter factory.
- "(8.) One man killed by overdose of whisky in a distillery.
- "(9.) One man killed by being caught in a screw conveyor. This conveyor is used for carrying grain from the stores to the kiln, and the man, while trying to cross over the same while it was in motion, was caught by it, and terribly mangled.

"It will be seen from the above that the only accident which could be really attributed to want of protection was No. 1. In this case the water wheel was only protected by a wall about two feet high. The accident occurred during the severe frost of last year. The wheel was frozen, and the man, in order to better get at the lever to start it stood on this wall, and, his foot slipping just as the wheel began to move. The poor fellow was caught in between the wall and the wheel itself.

"2. The accidents under heading No. 2 were, as such accidents always must be, of a most terrible nature, the poor victims being literally torn to pieces by the rollers. And yet I am afraid both can only be attributed to gross carelessness. In both cases the rollers were provided with perfectly suitable feeding-boards 2 feet 6 inches to 3 feet wide, and both sloping down into the rollers, and it can only be supposed that the unfortunate victims stretched right over to free some flax, without stopping the machine. In some of the scutch mills, owners insist upon the workpeople being chained back from the machine, so that they can not possibly reach up to the rollers themselves. I always hesitate to make a suggestion that this plan should be adopted though, for I am advised by medical men that it is exceedingly dangerous and liable to bring on enlargement of the heart.

"(3.) Accident No. 3 I am afraid must also be attributed to negligence, for in making some alteration on the beetling engine he deliberately brought his head right under the wiper beam and was terribly crushed.

"The other fatal accidents speak for themselves, and need, I think, no further comment from me.

"With regard to accidents that did not prove fatal, by far the greatest number have occurred through circular saws. Unfortunately I have as yet seen no guard that is really a satisfactory protection against this dangerous machine. I should be only too glad to hear of something being invented, for every year we have a long list of accidents to report, occurring through this class of machine. Another frequent cause of accidents, some of them more or less serious, I find arises in mineral water factories,

through the bursting of bottles, and the number of these accidents should be very small. I am glad to say that I always find the owners are ready to, and do provide proper masks and mittens, but the men cannot be induced, in many places, to put them on, and they seem to prefer to run the risk of the loss of an eye to adopting the means of safety provided.

"I hope and believe that this large reduction of accidents is due to the better protection of the machinery. Owing to the increased inspection of the last two or three years, the requirement of the Act have become very much better known in this district. I am always very careful to give particular attention to the question of fencing, for I look upon this as one of the most important parts of our duties, and I am bound to express my thanks to the occupiers of factories in this district, for the ready manner in which they are willing to take up any suggestions as to fencing that I may make to them. It is very gratifying to find that it is quite an exception to have any trouble in this respect."

Mr. Shuter, H.M. Junior Inspector for the Dublin District, remarks :—

"The past twelve months have been marked by a general improvement as regards the observance of the requirements of the Factory Acts in the Dublin District.

"The greater portion of the irregularities that exist arise from the neglect to keep all dangerous machinery securely fenced; and it certainly is surprising to find occupiers, who, generally speaking, appear desirous to fulfil every obligation towards their employees, and are yet so blind to their own interests, as to neglect this most important branch of factory legislation.

"Oftimes this apathy is due to the structural disadvantages of the factory itself, as for instance in flour mills, where the floors are very close one over the other, often, there not being more than seven or eight feet between; it then becomes a vexing problem how to securely guard the mill gearing, and yet not make it an impossibility to carry on the work.

"Flax scutch mills abound in the north and north-west of this district, and the poor, wretched appearance they present, makes one wonder how it is they stand so long. Almost wherever a small stream of water runs, there a scrutch mill is erected, employing from four to sometimes 12 persons. Thanks to the frequent visits of Factory Inspectors during the past four years, almost all the machinery that is possible of being guarded is now securely fenced; but there is one great prolific source of very bad accidents, that it, is to a certain extent, impossible to remove; I allude to that portion of the machinery known as 'the rollers.' There are now to be seen two or three men walking about the north of Ireland without arms, they having been drawn out through becoming caught in the grip of these terrible rollers. But these men only represent a much larger number of persons who have lost their lives in the same manner. The occupier of an engineering factory, remarked to me on my arrival in Ireland, that 'a fortune awaits the one who invents a guard for these rollers'; and after two years experience among scutch mills, I am bound to admit that such a guard seems to be an impossibility, for when once you guard these rollers you prevent the work from being accomplished, for which the rollers are there. But, although, a guard is not forthcoming, yet there are one or two precautions that would serve to minimise the evil.

"First, the old fashioned rollers, known as 'crimping' and 'vertical' rollers, should be replaced by the 'patent' or 'flat' ones. The former consist of three rollers one over the other, the flax goes in between the top two, and comes out from between the lower two; this is repeated two or three times and the flax is 'rolled.' In the newer style, there are 12 rollers, six on top and six below; the flax goes in at one side and comes out at the other, finished.

"The possibility of the stalks of flax becoming wound around the rollers of the "patent" class becomes almost an impossibility, and as this is the cause of the operative being drawn into the rollers through endeavouring to extricate the stalks of flax, the advantage of the 'patent' over the old fashioned 'vertical' is at once apparent.

"Next, another precaution which should be adopted, and which would tend to minimise the evil alluded to, is to always have a moveable clutch fitted between the rollers and the main shaft, so that, in the event of anyone being caught in the rollers, they may be stopped at once, instead of having to wait until some one runs to the sluice and stops the water, and so brings all the machinery to a standstill. I regret to say that this very slow method is still to be found existing in some mills.

"Lastly, if broad, slanting, feeding boards, not less than three feet deep (that is, there is a board of three feet depth between the operative and the rollers), were fitted to the rollers, it would be more difficult for the operative to reach in and become caught.

Mr. Richmond, H.M. Inspector for Liverpool, reports:—

"Between November 1st, 1894 and October 30th, 1895, I received reports of 293 accidents of which 23 proved fatal.

"FATAL ACCIDENTS.

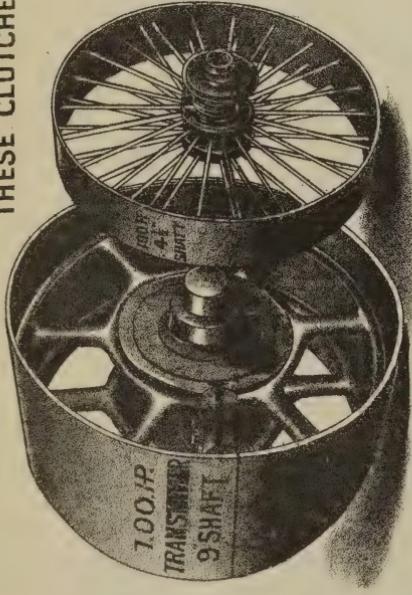
Chemical works	-	-	-	-	6
Glass works	-	-	-	-	2
Ship yards	-	-	-	-	5
Dye works	-	-	-	-	1
Distillery	-	-	-	-	1
Cotton kiln	-	-	-	-	1
Cement works	-	-	-	-	1
Forge	-	-	-	-	1
Brick works	-	-	-	-	1
Oil mill	-	-	-	-	1
Rope works	-	-	-	-	1
Soap works	-	-	-	-	1
Saw mills	-	-	-	-	1
 Total	-	-	-	-	<hr/> <u>23</u>

"Of these, 14 were caused either by fall of the men themselves, or by something falling on them; three by being crushed by waggons; three by falling into structures containing hot liquor; one from overhead shafting; 1 from a brick machine; and one from being overcome by gas. Two only of the fatal accidents, were therefore in anyway connected with machinery. Amongst the accidents, reported during the year, and enumerated above, are included 22 cases of sickness from lead poisoning, reported since June.

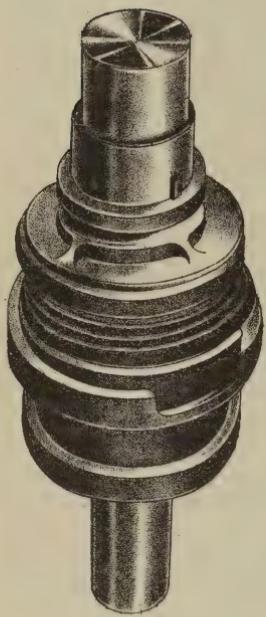
"It must not however, be concluded that these were all cases of primary sickness from the effects of lead. Most of the patients have worked for many years, and had become more or less impregnated.

LINDSAY'S IMPROVED COIL FRICTION CLUTCHES, SELF-ADJUSTING.

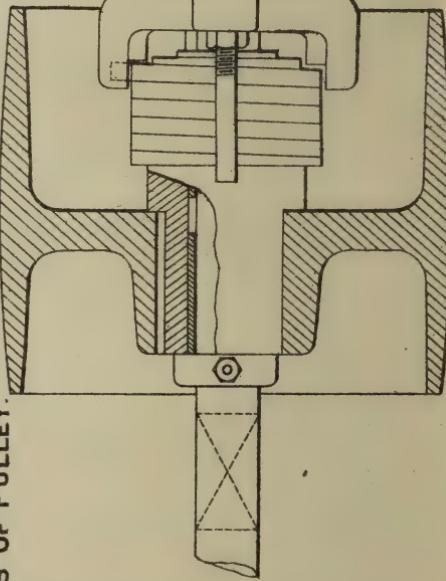
THESE CLUTCHES RANGE FROM 2 TO 2000 HORSE POWER.



700 H.P. ENCLOSED DUST-PROOF CLUTCH FIXED WITHIN THE
BOSS OF PULLEY.



1,200 H.P. COUPLING ON 13-IN. SHAFT.



*The coils are self-adjusting
any wear being automatically
taken up.*

"As satisfactory evidence, that the special rules for chemical works, have not been without some beneficial results, I may mention that at one factory the fatal accidents numbered, during the above period, only five against six and 11 in the two corresponding previous periods. Formerly the frequent cause of deaths at these works used to be falls into structures containing hot or dangerous liquor. Thanks, I have no doubt, to the first four special rules, there has not been a single case of the kind during the period under review. There were two such in the previous period, but not one since the special rules were established, the last having occurred in March 1894.

"Of the three fatal accidents mentioned above as having occurred through falling into structures containing hot liquor, one happened at a distillery, a well containing hot water being the cause. The second at a soap works, where a vat containing soap lyes was at fault. Whilst in the third case the manager himself, at the Australian Alum Company, lost his life through neglect of No. 4 of the special rules.

"I was lately requested by Captain May to inquire into an accident to a boy, at a tobacco factory, from the cog-wheels of a cigarette machine. I found, on inquiry, that the machine had only recently been erected, and is only one of a large number, which are being erected throughout England. These machines simply bristle with uncovered cog-wheels, and I fear there may be a number of similar accidents to fingers until they are properly fenced. It would be well that these machines should be looked out for at all tobacco works.

"Within the last Month the engine driver at Messrs. Twigge and Crosfield's rice mills, Liverpool, was found dead and dreadfully mutilated in the crank pit of the engine. The crank was railed, but the deceased would appear to have got over the eccentric rod on to the edge of the crank pit, in order to get across the engine over the crank shaft. Some waste, tools, &c., were kept on the far side of the engine, between the rails and the wall, but as, owing to the cramped state of the engine house, there was no very accessible way otherwise, he probably tried to cross the bed of the engine. I have since had the end wall broken through, and a proper passage made to that side of the engine.

"I cannot, however, too strongly condemn the practice, all too common, of making a storage place inside the guards of steam and gas engines especially. Nothing should be allowed to be kept inside the guards, as no engine driver will stop his engine to go inside to fetch anything needed.

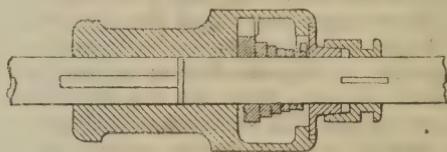
"In view of the new Act which comes into force on January 1st, 1896, my attention has been called to several accidents which have occurred in the district and which will in future come within the scope of the Act. In January a man was killed at a warehouse, by becoming entangled in the gear for hoisting purposes, moved by power. There have been several fatal accidents at the docks, and a serious accident at a steam laundry, where a boy lost his arm through machinery; whilst a fatal accident happened at a wharf near Hale through a steam crane.

"I enclose descriptive diagrams of certain safeguards to which my attention has been called. 'The emergency coupling,' shown on page 9 of the list of the Coil-Clutch and Pulley Co., Ashton Gate, Bristol was recommended to me in connection with a fatal accident which occurred at the rope factory of Messrs. Jackson, McCannan, and Temple, of which I append an account. I stated at the inquest that I thought some better means of stopping the machinery should be supplied, seeing that the engine was so far from the scene of the accident.

"At Wilson and Co's. bobbin works, Garston, I was shown a very ingenious contrivance called 'Berry and Snowden's crank-pin lubricator,' with which their large engines are fitted. It is, I understand, connected with Bell's Asbestos Company. It does away with oiling, on the part of the engine driver, and has the merit therefore of safety, as well as keeping the engine cool."

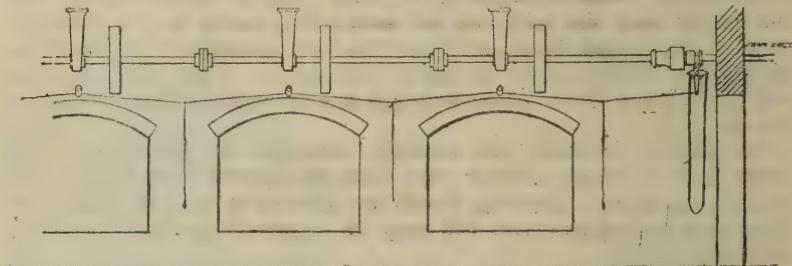
THE EMERGENCY COUPLING.

For use in factories, &c., by means of which a line of shafting may be stopped instantly from several points in a room, or from each machine.



Section through the emergency coupling.

The special features of this friction coupling are, that it requires no special arrangement of bearings each side of it; that being once in gear it requires practically no end pressure to keep it there; that when in gear there are no rubbing parts; that it requires a very small amount of pressure to put it in or out of gear, either of which can be done instantly.

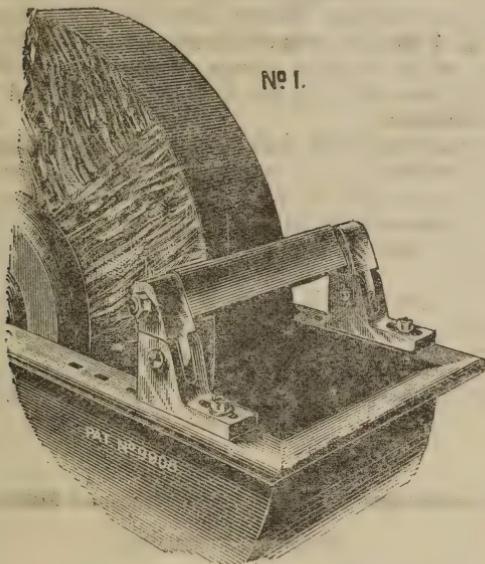


The above illustrates its application. A hand rope is within reach of the door, enabling the line of shaft to be thrown in or out of gear at will. By a simple arrangement of cords the whole of the machinery may be thrown out of gear, in case of accident, from any part of the room.

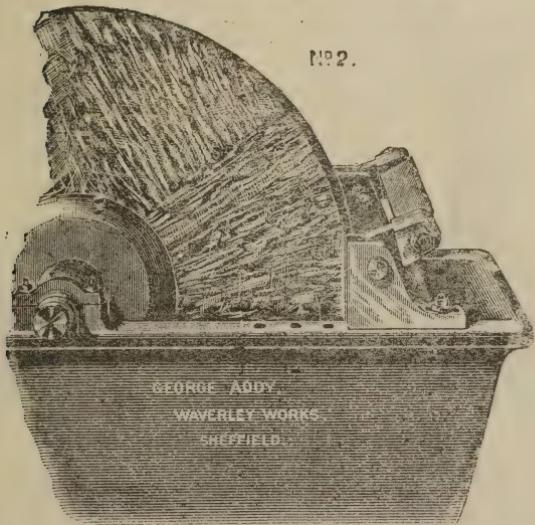
Not only has this clutch the advantages already set forth, but it can likewise be so arranged that in cases where very heavy machinery is in use, which, although in case of accident be instantly stopped, yet the labour required to overhaul them is great, and the time lost in so doing often fatal. This delay and labour is entirely obviated by pulling a secondary handle, when the machine will slowly reverse and automatically discharge anything caught or entangled in its mechanism in a few seconds.

ADDY and JOHNSON's Safety Grindstone Rest.

Patent No. 9,908.



View No. 1 shows the rest in position for grinding, turning tools, planing tools, &c.



View No. 2 shows the rest when pulled away from grindstone.

Explanation.

It will be seen from the engravings that this grindstone attachment is quite firm so long as a downward pressure is applied, as in the case of grinding tools for turning, planing, &c., but in the event of a man getting his fingers between the rest and stone (as unfortunately sometimes happens), at the first grip of the stone he naturally pulls his hand quickly away, which at once brings the rest in position shown on engraving No. 2, thus allowing his fingers to be released before serious damage has been done.

The number of men with maimed or amputated fingers met with in engineering works, caused by using the old-fashioned fixed rest, is a sufficient reason for the introduction of any appliance calculated to lessen the number of these painful accidents.

This safety rest can be applied to any grindstone, and is adjustable as regards height.

Price, delivered any town in England, packed in box, 25s. each.

When ordering, give distance between centres of brackets, height of rest from ledge of trough, and size of bolt holes.

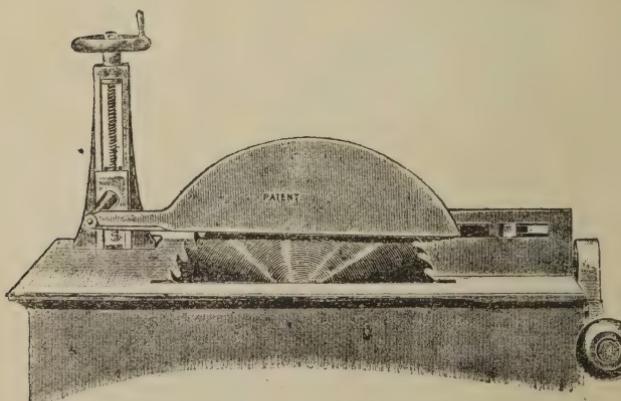
Sole manufacturer, GEORGE ADDY, M.I.Mech.E., Waverley Works,
Sheffield.

WOODHOUSE and MITCHELL, Engineers and Millwrights,
Brighouse, Yorkshire.

Patentees and Sole Makers.

PATENT SAW GUARD FOR CIRCULAR SAW BENCHES.

Woodhouse and Mitchell's Patent.



"The accompanying illustration represents an improved patent guard for the prevention of accidents from circular saws. It has long been proved to be dangerous to sawyers standing in front of revolving saws, owing to the liability there is of being struck by pieces of wood (caught by the back edge of the saws) hurled with terrific force against them.

Not a few cases have proved fatal; in others the sawyers have been rendered incapable of pursuing their employment, or have been considerably affected with the sawdust being forced into the eyes or absorbed into the lungs.

"These recurring facts have of late been brought before the notice of the authorities, who now insist upon some protection. Many attempts have been made to remedy the evil, but none have adequately answered their purpose.

"The illustration shows clearly the construction and method of fixing the patent guard. The standard is fixed to the bench top by two set-screws or bolts; in the centre of the standard is a rising screw, which works through the sliding arm which carries the saw cover or guard. The guard is raised and lowered by simply turning the hand-wheel on top of the standard, and thus made adaptable for saws of different diameters, or thicker, or thinner stuff. The cover is made semi-circular: the front side is a plate, whilst the back side is only partially shielded. The action of the saw in running naturally creates a current of air, and the air being conducted in the trough-formed cover, blows away the sawdust in front of the saw, enabling the operator to see the gauge lines or ascertain if the saw is cutting true. These last named advantages alone warrant the adoption of the guard, apart from the question of protection from danger. It will be noticed that the standard carrying the cover is fixed beyond the periphery of the saw, and thus does not interfere with, or lessen, the efficiency of, the bench for cross-cutting, whilst for sharpening purposes, by slackening the screws or bolts at the foot of the standard, it may be swung clear of the saw.

"The advantages of the guard may be summed up as follows, viz.:—

"I.—It entirely prevents accidents through the timber being thrown over the saw against the operator.

"II.—It also prevents sawdust being thrown in the eyes and face of the operator.

"III.—It prevents the sawdust accumulating in front of the saw, and,

"IV.—Its great efficiency and simplicity.

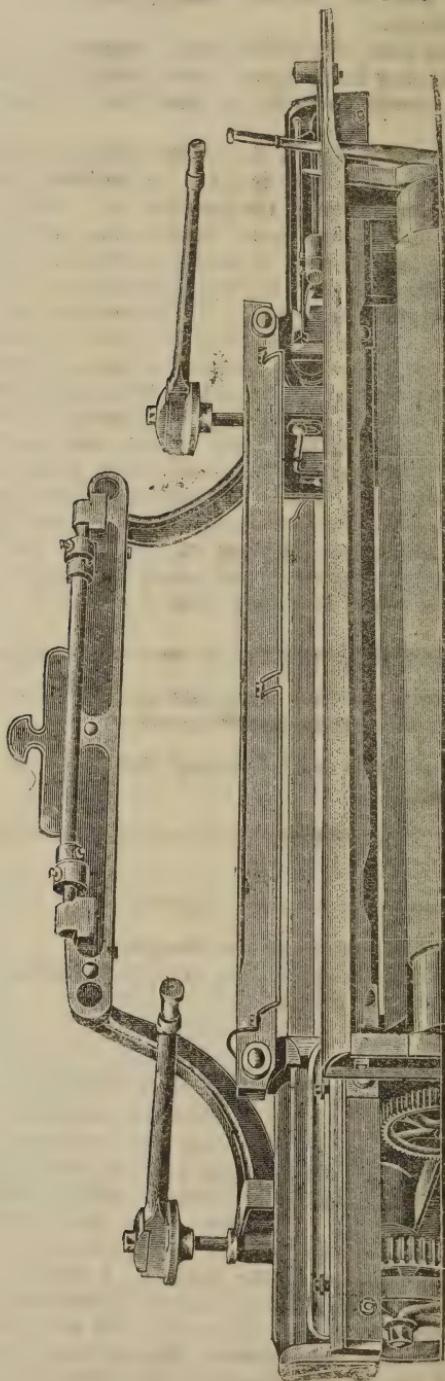
"It is adaptable to all makes of saw benches.

"Prices may be had on application to the sole makers and patentees, Woodhouse and Mitchell, Brighouse."

Mr. Knyvett, H.M. Inspector, Birmingham, remarks:—

"Passing from dangerous occupations to dangerous machinery, I venture to suggest to you that the time has arrived when possibly a collective effort should be made, by the express order of the Secretary of State or of the Chief Inspector, to fence certain classes of machinery, as being always intrinsically dangerous, and as being always, or in the great majority of cases, capable of the application of fencing, without detriment to the operations of the worker. I should, in fact, like to hear of the creation of an official 'Index Expurgatorius' of certain machines and machinery, so that inspectors and all other persons concerned might know that the contents thereof would *prima facie* be deemed worthy of the judgment, unless they were purged from their danger by fencing.

RHODES and THORNLEY'S PATENT BALANCE SHUTTLE GUARD.
Sample Guards sent free on inquiry.



Guard in Work. Price, 9½d. each.
For ordinary Looms weaving up to 38 inches.
All Inquiries : Isaac Jackson, Glossop.

"It is impossible to analyse a list of accidents tabulated at the end of a year, without being immediately struck by the fact that, although the fatal or more serious of these may possibly have been caused by mill-gearing (to which, very properly, attention is primarily drawn in the Act), the vast bulk of the accidents—accidents which ruin the value of a workman's right hand, or the hardly less sad ones which maim the fingers of women and girls—are the doing of machinery which is unfenced, and which is repeatedly proved to be dangerous.

"And, on such an analysis being made, it will be found that it is not a large class, but a very small class of machinery that is responsible for a very large share of the annual accidents. In my own district, for example, during the past year there have been 213 (being six more than in the previous year) accidents requiring, from their gravity, to be reported to me, and which have in all cases received investigation. While engines and mill-gearing, including all shafts, belts, pulleys, and gear wheels, have caused only 23 of this number, I find that circular saws alone are responsible for 22, including one which terminated fatally, and that 42 must be laid to the account of steam stamps, punches, and presses, while 21 are accredited to cutting and milling machines of various sorts.

"It may, I think, reasonably be asked if in the present age of State interference for the more complete safeguarding of machinery, nothing can be done to reduce these figures. It may be asked if manufacturers using these machines, with the knowledge of the injuries caused by them, will be content, as they so often are, to fall back on the usual statement about the carelessness of the workman, or on the equally usual (and often perfectly superficial) statement that any form of fencing is impossible in the particular instance.

"But if this way out of the difficulty still commends itself to certain classes of employers, it may then, I think, be considered whether by the increased powers now afforded by the Legislature, the Department should not, after due inquiry and consideration, frame a definite policy with regard to certain tools and machinery, and insist upon the fencing of these throughout the kingdom.

"I would, in the same way, suggest that hoists should in all cases be required to be fitted with self-acting doors or guards. There would, in that case, be a disappearance of the wretched absentee bars, which are of as little use, if not of as much harm, as those frequently met with in engine-rooms, placed close to the fly-wheel and just high enough to tumble over, and which I am always told have been placed there 'to please the Inspector.'

"Before leaving the question of machinery, I should like to return to an old point in my annual reports, namely, the danger arising from the practice of throwing belts from ladders, or otherwise, on to overhead pulleys. I have drawn manufacturers' attention to the various appliances which have been brought to my notice for obviating or diminishing the danger of this. I have cautioned manufacturers, foremen, and workmen, but the system goes on, and so do the accidents; and, being caused by shafting, they are generally bad ones. To parody the old Latin proverb, '*Caeca est stultitia et praevalebit*'; but I would confine the folly by making it illegal for any young person, or better still, for any person other than the engine-man, or someone whose special duty it might be, to throw a belt on or off any pulley above five feet from the floor, without mechanical assistance.

"The generality of the accidents have been of the usual character. Fatalities have occurred from a man leaning over a fence and being caught on a shaft; from the premature starting of an engine while a man was repairing it; by a fall down a lift while the faller was leaning into it to attract attention by rattling the chain at the side, a practice which was condemned by the jury, who considered that all lifts should be provided with electric bells for communication with other floors; by a man coming in contact with a circular saw while stupidly stepping across the rack in front of it and losing his balance; and in four other cases in which machinery did not play a part. There have been 59 accidents of a serious nature, in most of which limbs, or portions thereof, have been lost; and 124 cases of slight burns, contusions, and lacerations.

"One case calls for especial mention, in which a girl of 16 was sent by the express orders of one of the firm's representatives to clean a window from a position in which a shaft revolved within a few inches of her head, a practice which I was assured by the firm had been in vogue at their works for over 30 years. The girl received a compound fracture of the skull, and had she not lost her scalp on the shaft, would have been killed on it. She has survived the terrible injuries which she received, and has been given the very inadequate compensation of 69*l.*, which I recovered by way of penalty from the firm.

"I have expressed my views above on the subject of dangerous machinery, but I will repeat that so long as inspectors, without express orders on the subject, merely recommend certain forms of guards, whether for circular saws, printing machines, steam presses, or the like, the usual course is for objection to be raised in detail to the guard, as not being applicable in the particular instance. But my belief is, that directly it is realised that certain machines are absolutely required to be fenced, the manufacturers and their machinists will devise guards quickly enough, and relieve inspectors of the rather serious responsibility of fathoming any special sort of appliance."

Mr. Tinker, H.M. Inspector, Bolton, observed:—

"With your permission, I will once more deal with a question that has for many years been before you and your predecessors, viz., *shuttle guards*. During the last 12 years much prominence has been given to this matter in the Annual Reports issued by the Chief Inspectors of Factories, and shuttle guards have invariably been recommended, yet to-day tens of thousands of looms are running *without* guards fixed thereon, and the employees are still working at the risk of losing an eye, or receiving other injury from a shuttle flying. I am pleased, however, to report that during the last two years upwards of 24,000 looms have been fitted with guards in this district, and without a prosecution, and not an accident of any kind has happened where the same are in use. This, I think, should be conclusive evidence that shuttle guards are the means of preventing accidents. I am, however, sorry to say that such is not the case, for I am often being told by employers and weaving managers that no guard has yet been invented that will prevent a shuttle flying from the loom. That in all cases where guards have been put on production has been lessened; that the weavers do not like them, and would sooner run the risk of being hit than work with the guards on. To the foregoing statements I give an absolute and emphatic denial, and to prove same I may say, by the kind permission and assistance of Mr. F. Wilkinson, F.G.S., Director and

M^r Tinkers Report.

3RD

PLAN, SHEWING POINTS STRUCK BY SHUTTLE

IN EIGHT, OUT OF TEN TEST'S

WITHOUT SHUTTLE GUARD.

LOOM RAN 180 PICKS PER MINUTE

SHUTTLE FLEW OUT AT RIGHT HAND SIDE IN PICK'S N^O 1.2.4.6.7.8.

" " " " LEFT " " " " 3+9.

4TH

1ST

6TH

7TH 9TH

8TH

WITHOUT GUARD.

TEST N ^O	DISTANCE FROM CENTRE OF LATHE TO POINT STRUCK	HEIGHT OF POINT STRUCK
1	6 FEET 1 INCH	4 FT 8 IN
2	6 " 7 "	5 " 1 "
3	6 " 1 "	5 " 10 "
4	6 " 3 "	4 " 11 "
5	Shuttle Caught Spindle Stuck, and fell into Loom.	
6	5 " 8 "	4 " 2 "
7	5 " 11 "	4 " 2 "
8	8 " 5 "	4 " 3 "
9	6 " 3 "	4 " 2 "
10	AS N ^O 5	

THE OBSTRUCTION
THE SAME
IN BOTH CASE'S

VIZ.
PIECE OF STRING
RAISED $\frac{1}{16}$ OF AN INCH
(by piece of wood)
NEXT TO REED,

WITH GUARD.

TEST N ^O	RESULTS SHUTTLE DID NOT RISE ABOVE GUARD IN ANY CASE
1	Shuttle remained on loom between lathe and guard
2	" dropped into middle of loom
3	As N ^O 1.
4	Shuttle got wedged between box end & guard
5	As N ^O 1.
6	do.
7	Loom continued to run until stopped
8	do.
9	Loom ran for 20 pick's, shuttle remained on lathe
10	Loom continued to run one minute, shuttle fell into middle of loom

Secretary, Bolton Technical School, experiments were tried on one of the looms in the school, *with and without* shuttle guards, the loom running at the time 180 picks per minute. Mr. J. Crompton, Prize Medallist, City and Guild of London Institute, and lecturer on weaving and designing, Mr. Councillor Ferguson, M.D., Mr. John Warner mill manager, and Mr. Charles E. Cartwright, foreman mechanic, were also present, and took keen interest in the proceedings. The first test was *without* the guard. The cloth and warp were taken from the loom, the slag left in so that the shuttle could be thoroughly tried. A piece of string raised $\frac{5}{6}$ ths of an inch was then placed on the shuttle board 13 inches from left-hand box, so as to obstruct the shuttle in passing from one box to the other. At each end of the loom a large sheet of white paper was fixed, so that when the shuttle flew, the course it took could be seen, and the exact place it hit on the paper. The loom was then started, and the shuttle came out at the fourth pick, and hit the paper on the right hand side 4 feet 8 inches from the floor and 6 feet 1 inch from obstruction on shuttle board, to place struck on paper. The guard was then adjusted, and I may here state that it was made in the presence of the company by Mr. Cartwright, from a piece of $\frac{1}{4}$ -inch charcoal wire, in the short space of 54 seconds, and fixed on the loom in less time than four minutes. The loom was again started and ran about 10 picks, when the shuttle came out, but remained on loom between lathe and guard. The obstruction was then removed to middle of shuttle board and test two was tried *without* the guard, and the shuttle flew, hitting the paper 5 feet 1 inch from floor and 6 feet 7 inches from obstruction. The guard again put on and the shuttle dropped in middle of loom. Test three, *without* guard, the shuttle came out, hitting the paper 5 feet 10 inches from floor and 6 feet 1 inch from obstruction; with guard the same as test one. Test four, *without* guard, struck paper 4 feet 11 inches from floor and 6 feet 3 inches from obstruction. With guard shuttle stopped between box end and guard. Test five, *without* guard, shuttle struck spindle stud and fell into loom. With guard same as one and three. Test six, *without* guard, shuttle struck paper 4 feet 2 inches from floor and 3 feet 8 inches from obstruction. With guard same as one, three, and five. Test seven struck paper 4 feet 2 inches from floor and 5 feet 11 inches from obstruction. With guard, loom continued to run till stopped. Test eight, shuttle struck paper 4 feet 3 inches from floor and 6 feet 5 inches from obstruction. With guard, same as test seven. Test nine, shuttle hit paper 4 feet 2 inches from floor and 6 feet 3 inches from obstruction. With guard, the loom ran 20 picks and shuttle remained on lathe. Test 10, *without* guard, same as test five. With guard, loom continued to run one minute and shuttle fell into middle of loom. On no occasion when the shuttle flew from loom did it go less than 15 feet before reaching the floor, and twice it travelled over 20 feet. The loom was tried over and over again with the guard, but in no case could an accident possibly have happened. Whereas, in eight times out of the 10 without the guard, someone might have been seriously injured. I think the above tests will prove hard nuts to crack to those who say that no guard has been invented that will prevent a shuttle from flying from a loom. To further prove my denial, I cannot do better than put in the following three letters:—

“‘ DEAR SIR,

“‘ REPLYING to your inquiries *re* shuttle guards, we beg to say, we have 964 looms, and have a guard on every loom; it is about 12 years since they were put on, and during the entire period we have had no

injury to report to any single individual. Our weavers are so accustomed to them that their earnings are not less than without guards, that is, the production is not less than formerly, and no such thing as a protest or objection to them has ever been raised since first they were applied.

“‘ Yours truly,
____,

“‘ 23rd December 1895.

“‘ DEAR SIR,

“‘ In reply to your inquiries about shuttle guards, we have had them on 2,546 looms for about two years, and during the whole of that time we have never had an accident of any kind from shuttle flying out, and we consider it a good thing for manufacturers to adopt. The cost of putting them on was 7*l.* 13*s.* for wire, and our own men did the work in about two weeks. We have never the least complaint about them, and our weavers would not have them taken off again. Our production of cloth is quite as much as before we put them on, and every way they are quite satisfactory, both to employers and employed. The costs of shuttles per year are no more than they were before we put them on.

“‘ Yours truly,
____,

“‘ 18th December 1895.

“‘ The next letter is from one of the oldest and largest cotton manufacturing firms in Lancashire.

“‘ Report to H.M. Inspector of Factories for the Bolton District as to the efficiency of shuttle guards, after six months’ trial.

“‘ After a trial of six months with a stationary fixed shuttle guard, we have come to the conclusion that accidents are impossible. The shuttle may, on odd occasions, get out of the shed, *i.e.*, the yarn through which it travels, but it will be so deflected, thrown on the floor, by coming in contact with the guard that it will be harmless. Perhaps more so in this respect with a fixed guard than with an automatic one, as in the latter there must always be a tendency to give way when the bearings work loose. This evil is avoided with a fixed guard. Production, which is so vital an element at the present time, when every extra increases the cost, has in no way been retarded. Weavers, in all cases, after a few days when they have got used to them raise no objection, but prefer them. This is rather remarkable, as all persons know who have had charge of weavers that they are very conservative, and fight very hard at times against changes, especially if they think it will result in a loss of wages. I know that in the fancy and stave work branch of the cotton trade, that serious objection is raised on account of the light they take from the reed, but find it is more in fancy than reality, as no guard needs to be made of wire more than three-eights thick, thus reducing the shadow or shade cast by the guard to a mere trifle. Savings must ultimately result from adopting guards, as the momentum of any shuttle that should get out of the yarn is considerably reduced, and in thousands of cases it never leaves the loom, thus preventing loss from breakages of shuttles and resulting in better work, as there is nothing that produces worse work than a shuttle that commences to split and shell through usage.

“‘ Yours faithfully,
____,

“‘ I think the three above letters speak for themselves and need no comment from me. I ought, however, to say that the writer of the

second letter could give further testimony as to the efficiency of shuttle-guards by saying how much the firm paid, voluntarily, to persons injured by shuttles flying during the 12 months previous to putting on the guards. The writer of the last letter could also have stated that at the present time two women are now working, each with an artificial eye (voluntary) paid for by the firm, the other having been lost by injury caused by a flying shuttle. I herewith send you a plan which will give at a glance the places where the shuttle hit when making the experiments at the Technical School. In conclusion, I would suggest that we should give instructions to employers having power looms at work, to get shuttle-guards fixed on said looms within one month from time of notice, and if not complied with, a prosecution should at once follow."

Mr. J. T. Birtwistle, reports :—

"*Fencing.—Shuttle Guards.*—I have experienced considerable difficulty in getting the adoption of shuttle guards, and, at the time of writing I have probably only a few hundred guards affixed, out of a total of about 170,000 looms in my district.

"Employers, almost without exception, individually, and by their association, object to shuttle guards.

"Following the loss of an eye from a flying shuttle, I obtained a conviction for neglecting to fence a dangerous part of the machinery, before the Blackburn Borough Bench, in October 1895. This conviction is being appealed against, and will be heard before the Recorder at the Blackburn Quarter Sessions in January 1896.

"A great many accidents from flying shuttles are only slight, such as cut on face, neck, or arms, wound is at once dressed, and workers return to work, accident is therefore not reportable. I have, however, received notice, during the past three years of 43 accidents from shuttles, of these seven resulted in the loss of an eye, 14 others injury to eye or region thereof.

"It is difficult to understand, under such circumstances, and, considering the many and varied forms of guard in existence, in price anywhere from 4*d.* to 4*s.* each loom, why employers so strenuously, in this district, object to take means to prevent these accidents. There is one reason, slight in my opinion, in the fact that a particular class of cloth, known as Dhooties, is almost entirely confined to this district, in the manufacture of this cloth, the weaver has to, every few yards, insert a heading or stripe, crossing the piece, necessitating the use of two, three, or four shuttles, which, during the making of this heading, he is constantly changing from one to another, each change necessitating the stoppage of loom for a second while one shuttle is abstracted and another inserted. I admit, that, for a week or two, until weavers got accustomed to the presence of guard, they would find it troublesome, and perhaps it would, to a very slight extent, interfere with the production, but this would not be permanent, and, even if it was, ought not, after such evidence of serious danger, to be taken into consideration."

Mr. J. Law, H.M. Inspector, Preston, reports as follows :—

"During the year ending 31st October 1895, I have received 392 accident reports, 19 being fatal, 123 having occurred in textile mills, 126 in engineering works, and 74 in various other works. A number of accidents have happened through shuttles flying out of looms, but I am pleased to say that a large number of looms have now got guards affixed.

"The fatal accidents were as follows:—Three caused by hoists, 3 run over by locomotives, 2 circular saws, 2 articles falling on workmen, 3 persons falling, 2 scalded, 1 crushed between fly-wheel and bed of engine, 1 hit on head by portion of fly-wheel, and 1 caught between carriage and roller beam of spinning mule.

"A man was seriously injured at Preston, owing to a grindstone breaking in a spindle works. The firm have since affixed a guard over all their grindstones to prevent similar accidents in future. I enclose drawing of guard."

Mr. Lewis, H.M. Inspector for Wales, observes:—

"I have received 433 notices of accidents, as against 396 during last year. Of this number, 41 were fatal, and caused 46 deaths, as compared with 49 deaths last year.

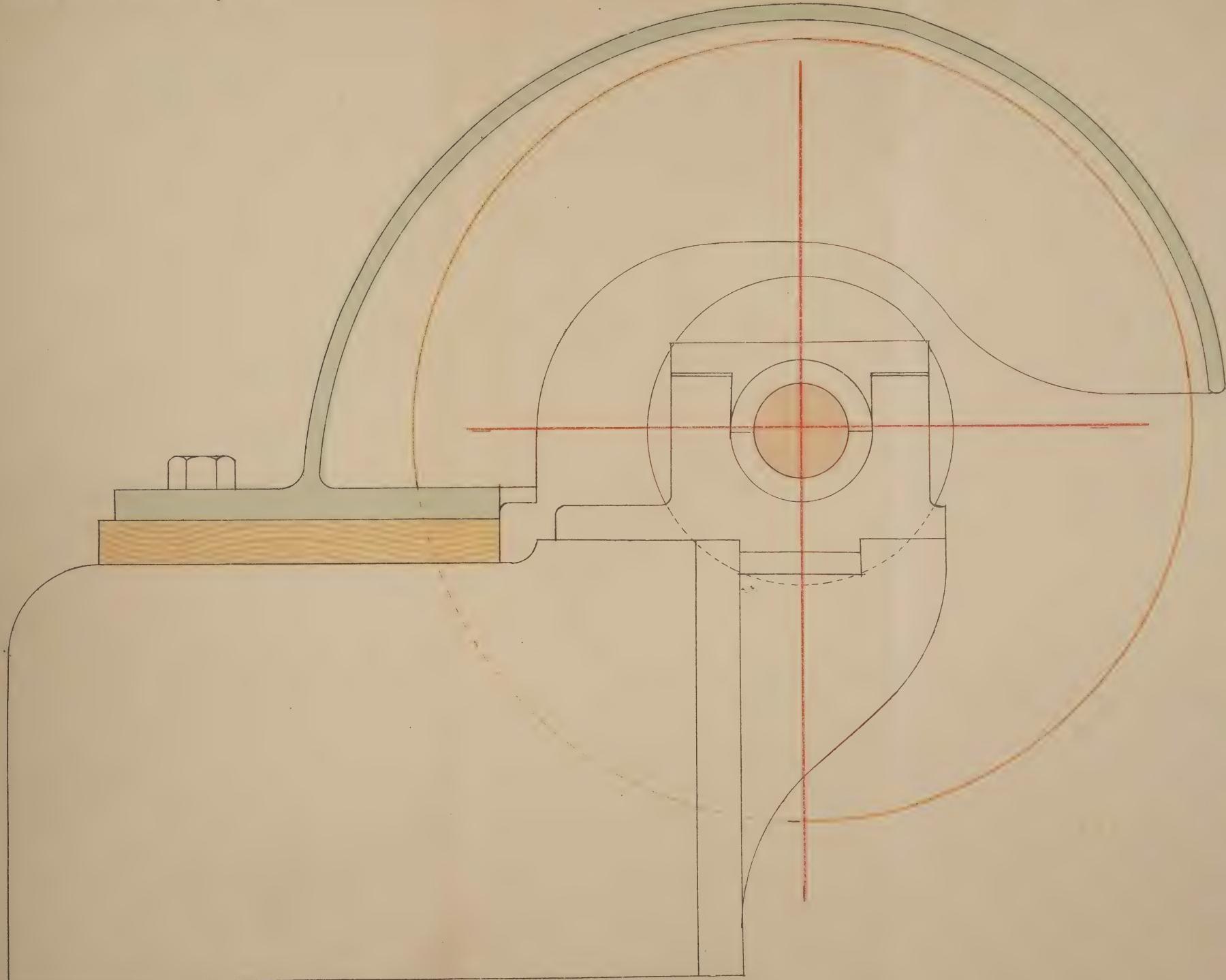
"The deaths may be classified as follows:—

Nature of Accident.	Number of Deaths.
Run over by locomotives, trucks, &c. - - -	12
Burns at blast furnaces and Bessemer steel process -	8
Falls from stages, gantrys, &c., in steel works, dry docks, &c. - -	6
Struck by flying timber from circular saws - -	3
Breaking of (1) wire rope; (2) chain; and (3) spur wheel of cranes. -	3
Suffocated by gas at blast furnaces and chemical works -	3
Scalded whilst cleaning boilers - - -	2
Caught by water wheel, whilst engaged in freeing the same from ice. -	2
Riding in lifts contrary to rules - - - -	2
Struck by tools in steel works and shipbuilding yards -	2
Adjusting belt on revolving pulley - - -	1
Fall into pickle vat in chemical works, whilst repairing pump, &c., on edge of same. -	1
Caught in cog-wheels, whilst superintending the repairing of machinery in the basement of a flour mill. -	1
Total - - - -	46

"*Inquests.*—With the assistance of my colleagues, Mr. Edwards and Mr. Hilditch, inquests touching 31 of the above-mentioned deaths were attended. Of the other 15 inquests, I received notice of two only, leaving 13 unaccounted for.

"In addition to the three deaths caused by circular saws, 15 non-fatal, yet serious accidents have to be attributed to these dangerous machines during the year. In view of these figures, one is certainly warranted in endeavouring to secure a more general adoption of saw-guards. The other non-fatal accidents, a large number of which were investigated and reported upon at the time, were attributable to various causes, such as mishaps on railway sidings, falls, blows from tools, explosions, and escape of molten metal, burns and scalds, &c., &c.

M^r Joseph Laws Report.



GRINDING MACHINE WHEEL GUARD.

"From want of closer supervision, the old practice of neglecting to replace safeguards after removal for repairs is still answerable for a number of accidents."

"*Fencing.*—Under this heading the matters which have chiefly engaged my attention during the past year are the dangers arising from unfenced sawing and joinery machinery, and from tin-plate cutting, stamping and pressing plant.

"At personal interviews, and by correspondence, I have brought to the notice of users of the above-mentioned machinery, certain kinds of safeguards, and have urged them to adopt one or other of the same, and from the manner in which my suggestions have been received, I am encouraged to continue my efforts in this direction.

"Serious and even fatal accidents have this year again been caused by circular saws. I venture to think that an unguarded circular saw in motion, comes within the meaning of the expression 'all dangerous parts of the machinery,' and that the user thereof is liable to a penalty under section 5, sub-section (3), Act 1878, as amended by the Act of 1891, section 6, sub-section (2)."

Mr. Hilditch, H.M. Junior Inspector for North Wales, remarks :—

"The fencing in this division is in a fairly satisfactory condition. I have nothing new to report under this head with the exception perhaps of a new safety hook or dog for raising timber. It is the invention of Mr. Jones, Messrs. Jenkins and Jones's foreman, of the Ruabon Saw Mills and Railway Waggon Works.

"A fatal accident occurred at these works in the early part of the year by the slipping of a pair of 'dogs' when lifting a log. While the improved hook or dog is almost as simple, and quite as conveniently handled as the old kind, it is practically impossible for it to slip by the jerking, &c., of the log, Mr. Jones informs me that he has no intention of protecting it. I therefore enclose a sketch of the hook. I also forward a sketch of an improved guard which I have had fitted in front of the rolls used for polishing or glazing hand-made paper. The guard prevents the hand following the parcel of paper into the rolls."

Mr. J. T. Birtwistle, H.M. Inspector, Blackburn, reports :—

"Having had several serious accidents from hoists or lifts, my attention was drawn by your report for 1894 to the automatic gates manufactured by Messrs. Worrall, of Byrom Street and Caerdon Street, Liverpool, which I have taken the opportunity of inspecting at work.

"These gates, as applied at the place where I inspected them, are applicable only, where a man is constantly in attendance, and whose sole duty is to work the hoist, but I see no difficulty in their application to a cotton mill or other place, where more than one person uses hoist and has other duties to perform, such as collecting goods from a room on one floor, conveying to hoist, and delivering on another floor. A description of the working of these gates with diagrams was given in your last report.

"To my mind the important advantage these or similar gates have over others I have seen, is in the fact that cage travels in any direction without interfering with gates other than at the floor required, and lifts gate up well out of way, and not outwardly. Gates that can be opened from outside, and even gates working automatically and opening at each floor upon approach, are a source of accident. I have often seen persons enter and leave cage where such gates were in use,

without stopping, and also to travel on top of cage. One accident I recently investigated, was to a worker who, having occasion to reach floor above, and to save a few yards walking or a moment's waiting opened door of hoist well, seeing rope weight ascending he grasped same, and was met by descending cage.

Mr. Harston, H.M. Inspector, remarks:—

“ Although a greater number of accidents may have been reported this year than usual during a similar period it is doubtful if a larger number have actually occurred. The increase in the number of notices is probably due to the requirements of the Act having become more widely known. The objections to fence dangerous parts of machinery are comparatively few; and, I think, as in the matter of ventilation, the opposition comes almost as much from the workers as from the employers. As an instance of this I may mention that on a recent occasion I found the vertical cutters of a moulding machine at a steam joinery works unguarded, though very dangerous on account of the cutters coming near to the side of the machine by which the men had to pass. Upon having his attention drawn to the matter the occupier admitted that the place was very dangerous, and promised that a guard should be fixed immediately; but the workman in charge of the machine protested against this being done, obviously because a guard would occasionally give him a little more trouble, and quite ridiculed the idea of any danger. Considering that the spindle made 1,400 revolutions per minute, and that I had only a few days before investigated an accident caused by a similar machine, resulting in serious injuries, I did not consider it necessary to discuss the point.

“ In the same town I was deemed by the engineer of a large flour mill to be wanting in the most rudimentary knowledge of the practical working of machinery, because I insisted upon a 10 feet diameter fly-wheel being fenced. He declared that it was absurd to call ‘a thing like that’ dangerous, as no one but himself was required to go near it. It is due to the firm to say that the engine had only been started a few days before, but no guard of any kind was fixed, and the engineer actually sat on the floor cleaning a portion of the revolving fly-wheel shaft with his legs hanging down in the wheel-race, at the time I entered the engine-room.

“ At another saw mills, in Southampton, a workman not long ago lost a portion of his hand while working at a planing machine. He afterwards went to work for another firm and was similarly employed. A guard was provided for the cutters, but the man foolishly neglected to make use of it, and he eventually lost the remaining portion of his hand.

“ Some occupiers there are, of course, who do not receive suggestions for fencing in a too friendly spirit. There is the contumacious individual who thinks the primary, if not the sole, duty of an inspector is to find some ground for complaint at every visit paid, and parries any request made with the remark, ‘I have never been asked to do this before,’ but perhaps the most peculiar of all is the occupier who objects to spend money in fencing because he has insured against accidents. It will, he imagines, be no expense to him if an accident does occur.

“ It is a matter of surprise that we have not a greater number of accidents caused by the side straps of carding engines, which I find are very rarely fenced. Card-room hands are generally females, whose loose clothing oftentimes render their calling a dangerous one; and it is a very common practice to clean the engine while in motion. I have

only been able to induce one firm to provide safeguards, and this has been effectually done by enclosing a considerable portion of the side in a moveable wooden frame. Belt shifters are also rarely seen attached to carding engines. The strap is generally moved by hand from the loose to the fast pulley and back again, whenever it is desired to stop or start the machine. The objection urged to the fixing of shifters, whenever I have asked for them, is that they would increase the danger, as the belt is frequently required to be crossed in order to run the engine the reverse way for the purpose of cleaning the cards.

"I only know of five fatal accidents having occurred in the district during the year. Three of these were investigated by the late Mr. Bowling and two by myself. Of the latter, one occurred at an encaustic tile factory, where a workman went on a roof on a dark and windy morning for the purpose of fixing a cowl on the flue of a stove. In order to get to the place the poor fellow had to step over a piece of revolving shaft, and in doing so the overcoat which he was wearing, no doubt got entangled, and he was battered against the roof almost beyond recognition. The ladder of which he had probably made use was found against the wall, but no one saw him go up, and his fellow-workers were first made aware of something unusual having occurred by the noise caused through his body coming in contact with the roof. Several of the workmen stated at the inquest that the man had gone on to the roof without consulting anyone or being instructed to do so, and as there was no apparent necessity for anyone to approach the shaft, the jury did not consider that the firm was in any way to blame.

"The other fatality occurred at a cement works in the Isle of Wight and was caused by the framework of a covered-in waggon, from which was worked a steam crane. An old man, employed on the works had, unknown to the man in charge of the engine, gone between the waggon and the river wall, for the purpose of supplying a boatman with drinking-water, and on the crane swinging round the poor fellow was crushed between the framework and the wall. I am afraid that fencing in such a case as this, even if practicable, would be of little use, as the waggon and crane are moved to different parts of the yard on a railroad for the purpose of loading and unloading.

Mr. Sedgwick, H.M. Inspector, reports with reference to the Walsall District :—

"*Accidents.*—I have pleasure in being able to report an important decrease in the number of accidents reported during the past year. The total number of accidents reported being 199, as against 268 of the previous year. This satisfactory result is, in my opinion, largely due to the increased power given to the inspector under the Act of 1891, and the more careful supervision exercised thereby by occupiers, managers, and foremen, who have readily listened to any suggestion I may have made as to fences, or guards, likely to prevent danger to those working under them. I have also noticed that greater care has been exercised by the workpeople, and have not had to call attention to the removal of fencing, put to safeguard life and limb, so frequently as I had to do in former years. At the same time, I think that many accidents are more the result of carelessness and inattention than the want of more effective guards to the working parts of the machinery. Employers have been willing to incur expense when necessary in order to provide for the greater security of their workpeople.

"I append table of accidents (fatal and otherwise), how caused, together with the sex of persons injured :—

"Between October 31st, 1894 and October 31st, 1895.

"TABLE OF ACCIDENTS, FATAL AND OTHERWISE."

How caused, Machinery, &c.	No.	Fatal Accidents.	No.
Circular and band saws - - -	7	Explosion of tube - - -	- - - 1
Pulleys, belts, and shafts - - -	14	Fall of sand - - -	- - - 1
Drills and cutters - - -	18	Fall from roof - - -	- - - 1
Planing machines, &c. - - -	5	Fall of iron stack - - -	- - - 1
Bolt screwing machines, &c. - - -	12	Explosion of boiler - - -	- - - 1
Bobbing and polishing machines - - -	5	Explosion of gas - - -	- - - 1
Lathes, &c. - - -	16		
Grindstones - - -	2		
Burns and scalds - - -	29		
Power presses - - -	33		
Iron rolls and steam hammers - - -	6		
Cogged wheels - - -	5		
Hoists - - -	2		
Explosion of gas - - -	2		
Miscellaneous - - -	37		
Total - - -	193	Total - - -	- - - 6
Fatal accidents - - -	6		
Total injured and fatal accidents - - -	- - - 199		
Sex of injured persons—			
Females - - -	- - -	- - - 25	
Males - - -	- - -	- - - 168	
Total - - -	- - -	- - - 193	

WOMEN INSPECTORS' DEPARTMENT.

I have received the following joint report from H.M. Inspectors in this department :—

REPORT FOR 1895.

Table of Contents.

1. General scope of work; special inquiries and reports; complaints investigated, &c.
2. Sanitation and work of local sanitary authorities.
3. Safety: hoists and other risks.
4. Dangerous or unhealthy occupations.
5. Overtime and the weekly half-holiday.
6. Employment of children and young persons; physical fitness; age, &c.
7. Fines and deductions.
8. The Act of 1895—
 - (a.) Laundries.
 - (b.) Evening interviews with workers in chief industrial centres, to give information and receive complaints.

SIR,

WE have the honour to submit to you, with your kind permission, a joint report for the year 1895.

In view of the transitional state of the regulation of factories and workshops and the importance of the new stage about to be entered upon, we are desirous of giving unanimous expression to our view of certain aspects of the problems before us, although in what follows, as will be seen, the account of our work necessarily diverges at certain points on individual lines.

During the year, in addition to ordinary visits of inspection, and an increasing number of special visits in response to inquiries or complaints in individual cases and particular districts, we have, under your instructions, made a large number of inquiries in branches or groups of industries, on special features of women's work, on sanitation, and on the administration of sanitary clauses by the local authorities. The results of these inquiries have been submitted to you in various reports. We have also in the latter part of 1895 been considerably occupied by visits to laundries, partly with the object of familiarising occupiers and workers in different districts with the idea of new responsibilities, partly with a view to completion and correction of preliminary registers.

We would specially refer to the work in which Miss Abraham has been and is still engaged as a member of one of the special committees on dangerous trades.

Before the appointment of these committees we presented reports to you on many of the occupations now under their consideration. Miss Abraham and Miss Deane presented a joint report to you on the following trades: Fur-pulling; rag sorting; laundry work (smoothing); yarn dyeing; manufacture of black lead and blue; use of bronze and metallo-chrome powder in lithographic works; artificial flower making; brush making; flock mattress stuffing; use of naphtha in india-rubber works.

Miss Paterson, who spent two months in making a close inquiry into the employment of women in the fish-curing industry in Scotland and the north of England, into which grave irregularities had crept through a practical extension of the exemption in section 100 (2) of the Act of 1878 to the processes of curing and preserving, made a special report on the results of her work in this direction.

Miss Anderson reported on processes involving use of bisulphide of carbon and naphtha in india-rubber works; bronzing in lithographic works; on processes of bundling, winding, &c., of yarn dyed with yellow chromate of lead; fur works; licking of labels for reels in thread mills.

Other special reports were from Miss Abraham on employment of children and young persons as outworkers in Macclesfield, Leek, Derbyshire, and elsewhere; from Miss Deane on fines and deductions in the hosiery industry and on home work in the Londonderry shirt and collar industry; from Miss Anderson on sanitary conditions in Dundee jute and hemp factories, and on overtime and home work of burlers and menders in the West Riding of Yorkshire.

Miss Abraham has visited in the Metropolitan District and in the following places: Hastings, Folkestone, Eastbourne, Dover, Ramsgate, Chatham, Strood, Deal, Sandwich, Hythe, Southampton, Portsmouth, Plymouth, Devonport, Exeter, Falmouth, and other towns in Devon and Cornwall; Ashford, Chichester, Oxford, Cambridge, Leek, Macclesfield, Ilkestone, Heanor, and various places in Derbyshire; Nottingham, Hull, Sheffield, Rotherham, Cardiff, Swansea, Dublin, Cork, Mallow,

1. General scope of work.
a. Special inquiries and reports.

Limerick, Clonmel, Waterford, Droguedha, Dundalk, Balbriggan, Newry, Portadown, Monaghan, Coleraine, Newtonards, Lisburn, Armagh, Londonderry, Belfast; these are in addition to special visits of inquiry in Newcastle, Manchester, and elsewhere.

Miss Paterson has visited the fish curing stations throughout Scotland and in the north of England and has travelled as far north as Wick. Among other places she has visited in England: Blackburn, Clitheroe, Darwen, Preston, Chorley, Blackpool, Haslingden, and other towns in Lancashire; Carlisle, Whitehaven, Workington, and other towns in Cumberland; Canterbury, Gravesend, Maidstone, and several places in Kent; Kingston and its neighbourhood; Newcastle and district. In Scotland: Glasgow, Edinburgh, Dundee, Inverness, Kilmarnock, Ayr, Dumfries, Kircaldy, Stirling, Falkirk, Wick, Thurso, and various places in Sutherland and Caithness; Lanark, Strathaven, Hamilton; in addition to special visits of inquiry to Stornoway and on the east coasts.

Miss Deane has visited: In London and neighbourhood the following:—Southwark, Blackfriars, Hoxton, City, Acton, Ealing, Wimbledon, Richmond, Twickenham, Putney, &c. In the Midlands: Birmingham, Wolverhampton, Walsall, Bilston, Wednesbury and district, Shrewsbury, Kidderminster, Stourbridge, Cradley Heath, Dudley, Worcester, Gloucester, Stroud, Oxford and Abingdon, Banbury and district, Rugby, Nuneaton, Nottingham, Long Eaton, Ilkeston, Mansfield, Sutton-in-Ashfield, Matlock, Lincoln, Louth, Horncastle, Spalding, Boston, Wellingborough, Kettering, Rushden and district, Leicester, Northampton and Earls Barton, Loughborough, St. Albans, Tunbridge and district, Hastings, St. Leonards, Bath, Bristol. In Ireland: Belfast, Carrickfergus, Lurgan, Lisburn, Newry, Banbridge, Ballynahinch, Ballymoney, Ballymena, Ballyclare, Londonderry, Strabane and neighbourhood.

Miss Anderson has visited, and in most cases repeatedly, Leeds and suburbs, Wakefield, Bradford, Shipley and Saltaire, Keighley, Huddersfield, Mirfield, Batley, Dewsbury, Heckmondwike and other Yorkshire towns and districts, Manchester and Salford, with suburbs, Chorley, Radcliffe, Mossley, Stockport, Macclesfield, Bolton and district, Wigan, Rochdale, Littleborough, Oldham, Ashton-under-Lyne and district, Burnley, Nelson, and other Lancashire towns, Matlock, Belper, Derby, Leicester, Melton Mowbray, Hinckley, Loughborough, Peterborough, Luton, Dunstable, Brighton, Kilburn, Hampstead, Highgate, Finchley, Barnet.

Further, the general extent of our work may be gathered from the following details:—Since the date of our last reports, October 31st, 1894, we have visited 2,358 factories, of which 884, or more than one-third, were found to have sanitary defects. We have also visited 4,599 workshops, and of these we formally notified 283 to local sanitary authorities for various sanitary defects. Our other visits, including preliminary visits to laundries, number 4,500.

c. Investigation of complaints.

With a view to illustrating our work in connection with the special duty of our department, namely, attention to complaints or information of infringements in connection with women's and children's labour, we beg to present a tabulated account of the claims made upon us in this way during the year. Though not yet considerable in extent, this branch of our work has increased very much in comparison with the similar work of 1894, and, since the knowledge of our address has been systematically placed within the reach of women workers by the supply of new abstracts sent out to every factory and workshop in the kingdom, this year, bearing in every case our label, it may be confidently expected that a very much greater increase will be seen in 1896.

TABLE I.—CLASSIFICATION OF SPECIFIC COMPLAINTS* RECEIVED AND INVESTIGATED.

	Number.
1. Want of separate sanitary accommodation and insufficient or defective sanitary accommodation	68
2. Insanitary, dirty, ill-ventilated workrooms	8
3. Overcrowding	12
4. Not fencing dangerous machinery (inclusive of complaints <i>re shuttles</i>)	7
5. Illegal overtime or employment after legal hours	61
6. Neglect to give weekly half-holiday	6
7. Employment on Sunday	3
8. Employment on holidays	3
9. Cleaning looms and other employment during meal times	3
10. Giving short meal-times	11
11. Employment of child full time	2
12. Rough treatment of young workers	2
13. Fines and deductions	7
14. No abstract or notices	5
Total	198

Eighty-one of these complaints were personally investigated by Miss Abraham, the remainder were dealt with in nearly equal proportions by the rest of our number.

Miss Paterson draws attention to difficulties in dealing with complaints which do not give sufficient information by the following remarks:—

“Unfortunately many complaints are so indefinite that they give absolutely no information at all. As a recent instance I may give the following. A note came to me with these words only: ‘You ‘are much needed at _____’ (an address given), unsigned, ‘undated. As a consequence I have visited the place referred to at night, during meal times, after working hours on the half-holiday, have questioned the workers separately and privately, and am still without a clue as to the cause for which I am ‘much needed.’ Even this, however, is not so difficult to deal with satisfactorily as the complaint that gives the name of a town and states that workshops there ‘want attention.’”

We have also received complaints with which we have hitherto not had, but now shall have power to deal, such as employment of women in sales after full period of employment in workshop was completed, excessive cold in workshops and factories. Further, there have been complaints of want of drinking water in factories, a serious matter still out of our control, but which we have pressed on the attention both of employers and medical officers of health. Other complaints coming under such special clauses as those relating to supply of particulars, regulation of humidity, have been forwarded to H.M. Superintending Inspectors for these special clauses.

The following table illustrates the general character of our work in Prosecutions, connection with prosecutions, the kind of cases in which it has appeared

* Complaints with verifiable particulars as to time and place, not general or vague complaints, of which there are many.

to us most necessary to recommend them and the number of convictions obtained :—

TABLE II.

Class.	Nature of Offence.	Pro- ceedings taken.	Number of Con- victions.
<i>Administration</i>	1. Failure to keep register of young persons and children in factory. 2. Failure to affix Abstract - - - 3. Failure to register, report, and affix particulars of overtime. 4. Failure to fix period of employment within prescribed limits and to fix and allow one hour for meals before 3 p.m. 5. Failure to keep prescribed list of out-workers. 6. Obstruction of H.M. Inspector - - -	3 15 32 2 1 1	3 15 32 1 1 1
<i>Sanitation and safety.</i>	7. Failure to limewash factory - - - 8. Failure to keep factory free from effluvia arising from privies. 9. Overcrowding during overtime - - - 10. Allowing child to clean machinery in motion. 11. Failure to fence a hoist - - -	10 2 1 2 1	10 2 1 2 1
<i>Illegal employment of protected persons.</i>	12. Employment of women and young persons during meal hour. 13. Employment of women and young persons for more than five hours continuously without interval for meal. 14. Illegal employment of women at night (after 10 p.m.). 15. Employment of women before commencement or after close of legally fixed period. 16. Employment of women and young persons after legal limit on half-holiday. 17. Employment of women and young persons on statutory holiday. 18. Employment of women overtime without giving extra half-hour for meal. 19. Employment of young person or child without certificate of fitness. 20. Employing child full time - - -	3 1 5 9 11 1 2 23 3	3 1 5 8 10 1 2 23 3
	Total - - -	128	125

The three informations laid on which convictions were not obtained have a certain interest. In the one relating to employment of a woman after legal hours on Saturday the magistrates held that the woman was not protected by the Acts because she had a very small share in the business, a point not mentioned before the case came into court, nor was the amount of the share stated in court. In the case of the information relating to failure to fix and allow one hour for meals before 3 p.m., the witness called proved hostile in court, and the Abstract, brought into court by the defendant, but not originally called for as evidence by

H.M. Inspector, had been altered since her visit by a label pasted over the notice as to meal times. The magistrates suggested that the point might be cleared up by removal of the label, but the solicitor for the defence protested against this on the technical grounds that the document had not been called for as evidence.

The third case was dismissed on the ground that the protected person on whose account the information was laid and by whose evidence the offence was proved could not be held as an unprejudiced witness because of an action pending between her and her employer.

In presenting to you the following tabulated account of the number 2. Sanitation. of sanitary defects notified by us to the local sanitary authorities, we are (a.) Sanitary anxious to lay stress upon the fact that it by no means represents the actual number of sanitary defects, more or less serious, which we have found in our general visits of inspection. Fortunately, in view of the delay, more or less general, involved in a dual control of the sanctions attached to what may be called the sanitary reconstructions clauses of the Factory and Workshop Acts, we frequently find employers who are willing to accept our recommendations without resort to further authority. In general our method hitherto has been to accept specific undertakings of employers, to make the alterations we consider necessary for health, wherever there appeared to be no reason for distrusting the *bonâ fides* of the employer. In some cases we regret to say it has been ultimately necessary to resort to further action, and on the whole it seems to us that in every case of the slightest doubt the safest plan is at the outset to prepare the ground for a resort to compulsion with the least delay. The proportion of the classes of defect reported speaks for itself, at least in the textile districts; both Miss Paterson and Miss Anderson have been much occupied by visits to the cotton factories of Lancashire (the northern and southern sections respectively) in the past year, and are most unfavourably impressed with the generally low standard, absolutely, and relatively to other parts of the kingdom, which is shadowed in the figures and circumstances given below. Both Miss Abraham and Miss Deane, having visited throughout Ireland, are equally unfavourably impressed with the sanitary conditions in factories here, and especially in the north.

TABLE III.—DEFECTS REPORTED TO LOCAL SANITARY AUTHORITIES.

Places.	Defective Sanitary Accommodation in Factories.		Defective Sanitary Accommodation in Workshops.		Other Sanitary Defects in Workshops.			Other Defects in Factory or Work-shop.	Totals.
	Want of separate Conveniences for Women.	Inadequate or In-sanitary.	Want of separate Conveniences.	Inadequate or In-sanitary.	Over-crowding.	Want of Cleanliness.	Want of Ventilation.		
	(1)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)	
Ayr -	-	-	-	-	1	-	-	-	1
Ballymoney -	-	-	-	-	1	-	-	-	1
Bamber Bridge -	-	-	-	-	-	-	1	-	1
Bath -	-	-	-	-	1	-	-	-	1
Batley -	1	5	-	-	-	-	-	-	6
Belfast -	-	4	1	1	-	1	-	-	7
Birmingham -	-	-	-	1	2	2	1	-	6
Blackburn -	-	7	-	-	-	-	-	-	7

TABLE III.—DEFECTS REPORTED TO LOCAL SANITARY AUTHORITIES—*continued.*

Places.	Defective Sanitary Accommodation in Factories.		Defective Sanitary Accommodation in Workshops.		Other Sanitary Defects in Workshops.			Other Defects in Factory or Workshop.	Totals.
	Want of separate Conveniences for Women.	Inadequate or In-sanitary.	Want of separate Conveniences.	Inadequate or In-sanitary.	Over-crowding.	Want of Cleanliness.	Want of Ventilation.		
	(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)	
Blackpool	-	-	-	-	1	-	1	-	2
Bradford	-	4	4	2	-	-	-	-	10
Bristol	-	-	-	-	1	-	-	-	1
Burnley	-	4	11	-	-	-	-	-	15
Camborne	-	-	-	-	1	-	-	-	1
Cambridge	-	-	-	1	-	-	-	-	1
Cardiff	-	-	-	-	-	1	-	-	1
Carlisle	-	-	-	1	-	-	-	-	1
Chorley	-	-	6	-	-	-	-	-	6
Clitheroe	-	-	4	-	-	-	-	-	4
Coleraine	-	-	-	-	1	1	-	-	2
Darwen	-	1	2	-	1	-	-	-	4
Derby	-	-	1	-	-	-	-	-	1
Devonport	-	-	-	-	2	-	-	-	2
Dingwall	-	-	-	-	4	-	-	-	4
Dover	-	-	-	-	1	-	-	-	1
Drogheda	-	-	-	-	-	1	2	-	3
Dublin and district	-	-	-	1	14	31	11	-	57
Dudley	-	2	1	-	-	1	-	-	4
Dumfries	-	-	-	-	1	-	-	-	1
Dundalk	-	-	-	-	2	1	-	-	3
Dundee	-	-	7	-	-	1	-	-	8
Eastbourne	-	-	-	-	1	-	-	-	1
Falkirk	-	-	-	1	-	4	1	-	10
Folkestone	-	-	-	-	-	1	1	-	2
Glasgow	-	2	7	12	4	1	1	3	31
Gornal	-	-	-	-	19	-	-	-	19
Hamilton	-	-	-	-	-	3	-	-	3
Heckmondwike	-	-	1	-	-	-	-	-	1
Haslingden	-	-	6	-	-	-	-	-	6
Helmshore	-	-	1	-	-	-	-	-	1
Higham Ferrers	-	-	-	-	-	2	-	-	2
Huddersfield	-	4	6	-	-	1	1	2	14
Inverness	-	-	1	4	1	-	1	2	10
Ilkstone	-	-	2	-	-	-	-	-	4
Keighley	-	-	2	-	-	-	-	1	4

TABLE III.—DEFECTS REPORTED TO LOCAL SANITARY AUTHORITIES—*continued.*

Places.	Defective Sanitary Accommodation in Factories.		Defective Sanitary Accommodation in Workshops,		Other Sanitary Defects in Workshops.			Other Defects in Factory or Workshop.	Totals.
	Want of separate Conveniences for Women.	Inadequate or In-sanitary.	Want of separate Conveniences.	Inadequate or In-sanitary.	Over-crowding.	Want of Cleanliness.	Want of Ventilation.		
	(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)		
Keith	—	1	—	2	—	—	—	—	3
Kilmarnock	—	2	—	2	1	—	—	—	5
Lancaster	—	—	—	—	1	—	—	—	1
Leamington	—	—	—	—	1	—	—	1	2
Leeds	—	2	3	4	1	1	—	1	12
Leicester	1	—	—	—	2	1	—	—	4
Lisburn	—	1	—	—	—	—	—	—	1
London	—	1	—	5	—	—	—	1	7
Londonderry	—	—	1	—	—	—	—	—	1
Longeaton	2	2	—	—	—	—	—	—	4
Luton	—	—	4	1	1	2	1	—	9
Macclesfield	1	—	—	—	—	12	—	—	13
Manchester	1	4	1	1	—	1	—	—	8
Maryport	—	—	—	1	—	1	2	—	4
Monaghan	—	—	—	—	1	1	—	—	2
Nelson	5	4	—	—	—	—	—	—	9
Newry	—	—	—	—	—	2	—	—	2
Northampton	—	—	—	—	2	2	—	—	4
Nottingham	2	2	—	—	—	—	—	—	4
Oxford	—	—	—	—	1	1	—	—	2
Peterborough	—	—	—	—	1	—	—	—	1
Portsmouth	—	—	—	—	—	1	—	—	1
Plymouth	—	—	—	—	1	—	—	—	1
Ramsbottom	—	2	—	—	—	—	—	—	2
Rochdale	2	—	—	—	—	—	—	—	2
Rugby	—	—	—	—	2	—	—	—	2
Shrewsbury	—	—	—	1	—	—	—	—	1
Southampton	—	—	—	—	—	6	—	—	6
Stirling	—	—	—	—	1	4	—	—	5
Strathaven	—	3	—	2	—	—	—	—	5
Thurso	—	—	—	1	6	—	—	—	7
Walsall	—	—	1	1	—	1	—	—	3
Wednesbury	1	—	—	—	—	—	—	—	1
Wellingboro'	—	—	—	—	—	1	1	—	2
Wick	—	—	—	—	2	1	2	—	5
Wigan	—	2	2	—	—	—	—	—	4

TABLE III.—DEFECTS REPORTED TO LOCAL SANITARY AUTHORITIES—*continued.*

Places.	Defective Sanitary Accommodation in Factories.		Defective Sanitary Accommodation in Workshops.		Other Sanitary Defects in Workshops.			Other Defects in Factory or Workshop.	Totals.
	Want of separate Conveniences for Women.	Inadequate or Insanitary.	Want of separate Conveniences.	Inadequate or Insanitary.	Over-crowding.	Want of Cleanliness.	Want of Ventilation.		
	(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)	(8.)	
Wigston	—	—	—	1	—	—	—	—	1
Whitehaven	1	—	—	—	—	—	—	—	1
Wolverhampton	—	—	—	—	3	—	1	—	4
Workington	—	—	—	1	1	—	2	—	4
Totals	38	104	30	62	73	82	28	7	425
Reported defects in sanitary accommodation:— (a.) In factories. (b.) In workshops.	142	—	—	—	—	—	—	—	—
	—	—	92	—	—	—	—	—	—

(b.) Difficulty in enforcing suitable as well as sanitary arrangements.

We are unanimously desirous of giving a most prominent place in our report to the pressing question of sanitation, and of recording our common experience that the limitation of the law, so far as it regulates the provision of proper sanitary accommodation, leaves the inspector handicapped in dealing with the kind of complaint, which, as is indicated by our classification of complaints above (p. 101), affects most heavily the persons for whom factory legislation primarily exists. So far as law is concerned it is almost impossible to introduce considerations of suitability or propriety in the arrangements where they do not exist, except with the employers who are already willing to be guided. England appears to be the only great industrial country in Europe which has no clause in its factory legislation requiring general propriety as well as health in these arrangements.

Going into another aspect of the problem, we have all been painfully impressed by frequent instances of local neglect, on a large scale, to cope with the sanitary requirements of an inflowing or expanding industrial population. The most serious defects and improprieties, not only in single factories, but in groups of them, must, perforce, remain for months unremedied, owing to the entire lack of forethought for pressing questions of drainage.

Miss Abraham remarks:—

“When one points out that nothing short of a fresh construction of the sanitary system in a factory will meet its necessities, the reply in too many cases, even in old established industrial centres, is, that no means of drainage are available until the corporation have cut a new drain under a canal, or carried out some equally imposing public works.”

The Austrian Industrial Code provides that every factory (in the English sense), in addition to every workplace where an unhealthy

process is carried on, shall be bound to obtain a preliminary certificate of approbation from the "Industrial Authorities." It is now possible to study the working of a Prussian decree of 1894 to the same effect. The inspectors there are agreed that although it involves at first an increase of work, this is already amply repaid by the good results in lighting, ventilation, and sanitary arrangements generally, while in a few years, also, another result will become apparent in simplified inspection. Further, they allege that the employers, no less than the competent authorities, recognise the value of the economy resulting from a preliminary examination by an expert. As an Austrian Inspector remarks, "this is the surest way of avoiding vexatious disturbances of the business otherwise inevitable."*

Our own experience in not a few cases among workshops, where we have been requested to look at new rooms about to be opened, leads us to believe that here, too, employers would not be averse to such a change.

Miss Paterson, contrasting Lancashire with Scotland, shows that comparison is unfavourable to the former in the matter of sanitary accommodation, and observes:—

"Defective in structure, in light, in cleanliness, in ventilation, as well as objectionable in situation, the conveniences provided are, from the point of view both of health and decency deplorable. The fact that the present arrangements are so frequently acquiesced in by the women employed impresses me strongly with the necessity of continuing to protest against the continuance of the existing conditions. In those factories, especially in which a large number of children are employed, the moral injury caused by the present system can scarcely be overestimated. These come to the factory at an impressionable age, and it is a serious matter to place them amid surroundings which may, and indeed must, tend to blunt their sense of modesty. I am strongly of the opinion that a much more elaborate lavatory system is required than is to be found, except in a very small number of factories, and hope that at some time, I may see it made compulsory for employers to provide some place in which the women may hang up their outdoor wearing apparel, where hands and face may be washed, and with which suitable sanitary accommodation will be connected. At present the usual method is to hang hats, shawls, &c., round the walls of the shed, and washing, which many would like to do, after being in the factory for 12 hours, is out of the question. The sanitary conveniences, generally as small as possible, are placed, men's and women's alongside of each other, whether opening off a shed in which both sexes are employed, or in the yard, with utter disregard of privacy. In these cases as well as in others even more objectionable, in which the women's accommodation is in a slashing room or other part of the factory in which men only work, I think it a matter for regret that the inspector has no means of enforcing a standard of decency as well as of cleanliness. In many cases, I am glad to say, I have been able to effect improvements after considerable delay, but the majority of employers show great indifference to this matter. Many objections are made to any change. I am told that it would be difficult to keep the women at their work at all if there were some cloak room in which they could meet and talk. (Strangely, this objection is urged only by the employer whose arrangements are of the most inefficient kind.) The loss to the pieceworker if she leaves her looms standing, is so much more serious than the loss to the employer, that I think she might safely be trusted to look after her own interests to that extent.

* Cf. *infra*, pp. 199.

I am also told by employers that they hear no complaints from the women in their employment. They are not likely to do so, but I am resolved that they shall hear many from me."

Miss Deane, referring to a special inquiry made by her concerning sanitation in factories in the Midland and Black Country districts reports :—

"Contrary to my expectations I found that the sanitary condition in factories where women were employed compared in no way favourably with that obtaining in workshops, although the larger numbers, employed in factories makes the matter of even more importance. I have been glad to find that in some cases the unsatisfactory conditions have been remedied by employers when once their attention has been called to the subject, and the satisfaction with which such changes have been received by the women becomes almost pathetic when it is recollected that a healthy and decent condition is not, after all, such an overwhelmingly beneficent privilege.

"I regret that in too many cases the long continued negligence in this matter has produced the inevitable consequence of a low standard of tone and behaviour, the blame for which should in justice be thrown upon the carelessness which has permitted such conditions, rather than (as is too frequently the case) upon the unfortunate victims of such a state of affairs.

"The eagerness with which the women have received me, as a woman, and the fact that by far the larger number of complaints I have received relate to insanitary conditions in factories seems to emphasise the need which exists for such an inquiry."

Miss Abraham and Miss Deane have both visited flax-spinning and weaving factories and other branches of the linen industry in the north of Ireland where the sanitary conditions leave much to be desired, and they report :—

"The difficulties on this point have been much enhanced in certain instances where the erection of large factories and rapid influx of population has turned small villages almost suddenly into manufacturing towns, whilst no measures have been taken to meet the increased requirement by a corresponding advance in the method of sanitation, the primitive and chaotic condition of which has produced very unsatisfactory and deplorable results.

"Apart, however, from the general view of the requirements of a whole neighbourhood, we found a general lack of adequate or suitable arrangements in the mills and factories, such accommodation as existed, often grievously wanting in the first elements of decency, and generally opening directly into the hot, steaming spinning or weaving sheds, an arrangement which results, where the sheds are mechanically ventilated, in an indraught of foul air, a consequence almost certain to follow when the sanitary arrangements open directly into the workrooms."

Miss Abraham has been gratified in a few instances by the care with which sanitary improvements have been carried out in Ireland, and believes that some good has resulted from a conviction obtained by her in the case of one firm. An order was made by the magistrates for the execution of the works necessary to bring the factory into conformity with the Act, and the alterations were consequently carried out in a thoroughly satisfactory way.

Miss Anderson desires to draw attention to the support given by the Wigan Borough Magistrates in a case of gross neglect of sanitary matters brought by her before them :—

"The spinning company prosecuted had neglected to abate effluvia in numerous rooms in their large mills where many hundreds of women, girls, and children are employed. Structural alterations were necessary and in the first instance I reported the matter to the local sanitary authority, and drew the attention of the managers of the mills formally in writing: (a) to the violation of section 3 of the principal Act; (b) to the fact that the sanitary accommodation was insufficient for the women and girls, and not separate for their use. When I returned after six weeks from a distance, having received no reply to my letter to the Company, nothing had been attempted beyond some limewashing, no alterations whatever had been made in the system which remained the source of intolerable effluvia in the hot spinning rooms. I was informed that the necessary plant for re-constructions had been ordered and that the work would be commenced. I returned again after two month's absence to find things exactly as before. I then recommended as a preliminary measure a prosecution for infringement of section 3, which you, Sir, sanctioned. The sanitary inspector for the borough assisted me by his evidence in court, and practically no defence was offered. Under section 81, the magistrates imposed not only a fine and costs, but made also a detailed order for the entire removal of the existing system and the reconstruction within four months of a proper system of sanitary conveniences, flushed, not communicating directly with workrooms, entirely separated for the sexes and in number sufficient for one convenience for every 25 workers. If we might rely on similar support from magistrates in every case, the enormous work that remains to be done would seem more possible of completion than at present, but the kind of result attained in this case, is of course one which, under the Act of 1891 is primarily in the hands of the local sanitary authorities, and which we can only take in hand after delay.

"In another large factory, in the same town, where in consequence of my complaint the sanitary system has been re-organised in the course of the autumn, I found, after taking the case just mentioned, even worse conditions. Not only were the conveniences, opening directly into the workrooms, without any kind of system of flushing or trapping, and common to both sexes, but their doors even had been removed on the grounds that the workers wasted their time. Matters are indeed bad enough in many towns of Yorkshire, but the average has certainly not fallen so low as in Rochdale, Burnley, Wigan, and other large towns in Lancashire where such cases as I have cited are by no means isolated. I found in 10 per cent. of the Dundee jute factories visited a standard of comfort and propriety as yet undiscovered by me in the north of England. Often inadequate and sometimes thoroughly bad as was the accommodation in that town too, it was at least satisfactory to reflect that the question of separate arrangements for the sexes need not be raised, that at least is taken for granted."

In a few cases, e.g., Leeds, Huddersfield, Derby, we have received from the sanitary authority, or the medical officer of health, voluntary reports on the action taken in consequence of our complaints notified to them. The aid thus given us has been appreciated, and it is satisfactory to reflect that under section 3 of the Act of 1895 this assistance is to become universal, thus greatly simplifying our work, bringing us into closer communications with the sanitary authorities, and consequently enabling us to achieve more work in a given time. We have taken every opportunity of conferring with medical officers of health and sanitary officers on the subjects that we had to bring under their observation. In Batley Miss Anderson particularly received an invitation to a conference with the sanitary council. Similar action on the

Co-operation
with the
Local Sanitary
Authorities.

part of sanitary authorities generally would lead, we feel sure, to satisfactory results. Miss Anderson further remarks on the regular way in which sanitary inspection of workshops is being effected in Bradford. Both there and in Huddersfield she has received assistance from the sanitary officers. "In important Lancashire towns on the other hand," she writes, "I have found sanitary officers handicapped by "the slowness of the local authority to apply compulsory measures. In "one town, on revisiting a factory with inadequate sanitary accom- "modation not separate for the sexes, I found that cumbrous measures "of investigation, ending in no visible result, were applied, where "prompt action appeared the proper course. The manager informed "me that the whole sanitary council, on my notice, had visited the mill "two cabs full of them, including the ex-mayor and several aldermen," "and that they had then taken no further action."

Miss Paterson adds :—

"So far as I am aware, with a few exceptions, little independent inspection of workshops has as yet been undertaken by local authorities. Acknowledgments of all complaints sent have been received from the clerks to whom they have been addressed, but on paying second visits the results have not always been found satisfactory, and the delay in taking any action is frequently excessive. I may recall to you the case of two factories in a Lancashire town, in which I found the sanitary accommodation very defective, and reported to the local sanitary authority that the introduction of water flushing seemed necessary. I was then informed that these factories had been visited by the local officials previous to my visit, and the matter was in their hands. On account of delay I made further inquiry, and then found that the visit referred to had been paid considerably over a year before mine. Instructions had been given to the occupiers to make those alterations, which I afterwards suggested, but no steps had been taken to see that these instructions had been carried out. Workrooms can seldom be satisfactorily ventilated by means of a window, and I have frequently to report the want of more efficient ventilation. On revisiting a workroom I find it as before, and it seems as if no action had been taken. Dr. Bird's method (an excellent one in many cases in my opinion) of raising the lower half of the window and inserting a board there, so as to admit air between the sashes only, may have been recommended, but it is only after many inquiries that the board is produced with the triumphant remark, 'We have got a ventilator,' as if there were some peculiar virtue in the board itself, although it may have to be brought out of a cupboard. The provisions of section 3 of the Act of 1895 will be of great value as forming a connecting link between the two authorities.

"The bedroom-workshop I think objectionable altogether. Many of these are still to be found, especially in country towns and villages, and are invariably wanting in ventilation. This dual use of a room, for bedroom at night and workshop during the day ought, in my opinion, to be prohibited. It is difficult to persuade workshop occupiers of the importance of this ventilation, but the necessity for constant and efficient ventilation will manifest itself more than ever I believe when, in order to conform to section 32 of the new Act, gas will be more constantly kept burning, and the air, in consequence, becomes more rapidly vitiated."

3. Safety. The year just closed has given us a considerably extended basis for observation on the sources of danger in connection with machinery and organisation of work in factory life.

Hoists. We are particularly desirous of drawing attention afresh to an almost universal occasion of risk where large numbers of young, and

consequently thoughtless workers are found. In the absence of any general statistics as to causes of accident it is difficult to estimate the proportion due to hoists alone; but it seems that too large a proportion of the press notices of accidents (setting aside the comparatively small number we personally hear of) refer to this one cause, which we think with better organisation and control within the factory, added to rigid enforcement of the most improved form of fencing, might cease to be a serious source of danger. Our only wonder is that under existing conditions the accidents from hoists are not more frequent. The provision of the best fence to the hoist-well on every stage, including the lowest, appears to us to be, important as it is, only a preliminary step towards security, always assuming that the lift itself is in sound condition and regularly tested to this end. From our experience we can only conclude that in the majority of cases it is the business of everyone, and therefore of no one, in the factory to see that the conditions of safety in the use of the hoist are observed. The kind of fence is a separate question and so long as the entrance is not compulsorily closed by the kind of fence or barrier which falls automatically into place when the hoist leaves a stage, there is always a chance that a stray worker forgets to drop the fence into place or close the barrier.

The other conditions which appear to us equally important and which are flagrantly neglected, almost universally, are :

- (a.) The consistent use of hoists only by or under supervision of a responsible person with a deputy in case of his temporary absence, at least so far as young persons, children, or inexperienced workers are concerned;
- (b.) Organised use of signals, oral or visual, to indicate when the hoist is in use;
- (c.) Use of legible notices on every stage to show the capacity of the hoist, whether for goods or for persons;
- (d.) Free use of warning or danger notices in short, clear terms, at every part where there is any sort of risk;
- (e.) Rigid enforcement of regulations as to artificial lighting in every case where risk can arise without it.

Various models for special regulation of the use of lifts, hoists, &c., may be seen in the rules of the German Accident Insurance Trade Associations (*e.g.* cf. infra, p. 155.)

We should be glad to think it possible that the use of every hoist might be scheduled as dangerous and therefore subject to special rules, equally with the use of locomotives in factories.

Miss Anderson is particularly anxious to lay stress on her experience, in the large textile and clothing factories of Yorkshire and Lancashire, that the utmost carelessness prevails as to the use of lifts by younger persons and children, and her belief that only in a spasmodic way is any attention given to this matter by too many employers (or their representatives). On one occasion, in the case of a lift provided with vertically-barred gates, which lifted and fell automatically as the hoist approached and left the stage, she with difficulty captured and warned a boy of 13 after he had scrambled, while the lift was in motion, under the moving gate on to the stage where she stood. He was in the lift with several boys of his own age and no person took any charge of the matter.

Miss Deane also desires to draw attention to the similar risks Cranes in attending use of cranes in tenement factories. The doors on the tenement landings, are often left open; especially is this frequent where light is scarce and the door not divided horizontally in two parts. Boys and factories.

girls rush up and down stairs, which rise at right angles to these openings, often carrying loads that do not add to their powers of regulating the rate of their movements. The dangers are obvious, and accidents do occur.

Special risks
for women's
hair and
clothing.

In connection with the special risks to which girls and women are exposed in use of machinery, or working in proximity to moving machinery, we may say that we take every suitable opportunity of urging and encouraging them to dress hair and wear clothes in a way likely to reduce the risks to a minimum. It is lamentable to think of the number of cases of scalping which will occur in one year through incautious approach with fringe or loose hair to driving bands or shafting, and the latter perhaps especially in clothing factories and lithographic printing works.

Miss Anderson writes :—

“ I entered a factory a few months since, half-an-hour after a young girl of 14 had been carried to the infirmary with a compound fracture of a leg and other injuries. She had been at work at a card there for several weeks and was esteemed as a careful, clever, and good worker. In the endeavour to keep her card in good order, by steady cleaning, her skirt had been caught in the driving band and the mischief was done. I cannot refrain from adding that she kept perfectly clear and conscious under her injuries, and had been chiefly concerned that no one should alarm her mother who was ill at home. Such events bring home a realisation of the value of, and the great need for the prohibition in section 8 of the Act of 1895.”

Miss Paterson observes :—

“ Other matters which are causes of dangers to workers, in my opinion, are in textile factories :—

- “ (1.) The slipperiness and unevenness of the floors in many departments, more especially where, owing to the machinery being crowded, there is little space to walk.
- “ (2.) The narrowness of the passage leading to the exit or to the sanitary accommodation, this being in more than one factory I have visited less than 12 inches in width.
- “ (3.) The custom of hanging shawls, &c., to the walls of weaving sheds, where, to reach them, the workers have to bend down to avoid the driving belts between the looms and the overhead shaft.
- “ (4.) The slippery wooden stairs between flats, and the frequent absence of hand-rails on these.”

4. Dangerous
and unhealthy
occupations.

Flax factories
and use of
respirators.

Our general view of the great value of the special rules in unhealthy occupations will be gathered from the following individual accounts of our experiences in various industries. Continual vigilance is necessary to secure that these rules are thoroughly applied. We are anxious to lay special stress on the value, in our opinion, of the regulations, where they exist, for periodical medical inspection. Miss Deane's account of the difficulties attending enforcement of the use of respirators, where these are required, might be further illustrated by each one of us. Miss Abraham, for example, on one occasion, on inquiring of a little girl why she was not wearing her respirator was met with the truthful reply that “ they did not know the inspector was coming.” Miss Abraham's experience that children are often the most straightforward of witnesses might also be illustrated by the following instances gathered by Miss Anderson in the hackling room of a flax factory: (i.) A.B., aged 14, without a respirator, once wore

one for half an hour, could not remember when ; (ii.) C.D., aged 13, without a respirator, never told to wear one regularly ; (iii.) E.F., aged 11, without a respirator, never given one nor asked to wear one ; (iv.) G.H., aged 11, at work in the factory a week, never saw a respirator ; (v.) I.K., aged 13, at work two years, never given a respirator, sometimes saw the other girls wearing them. These were all instances taken at random in a factory where the foreman and manager announced at the outset, in self-defence, when their attention was drawn to the general absence of respirators in the room, that workers could not be induced to wear them.

Miss Deane reports, on the use of respirators, as follows :—

“ The special rules in flax mills require the use of the respirator by the children and young persons employed in certain departments. That this is a necessary precaution seems to be admitted on all sides, and if the full benefit were obtained would most probably assist in producing a longer and healthier period of life than that enjoyed by a previous generation of flax-spinners, but I regret the unwillingness of employers to insist upon a fair trial of this excellent precaution by any active enforcement of it.

“ I have been most solemnly advised by more than one mill-owner, and his managers and foreman, in serious conclave, that their united will was powerless to cope with the inclinations of a tiny child of 12 years upon this point. (It has sometimes occurred to me whether this difficulty would be found equally insurmountable should the little girls or boys incline to drop matches, for instance, instead of their respirators, into the ‘sliver-cans.’)

“ On the other hand the case put forward by the children has its strong points. Most people would object to wearing a respirator which is worn in turn by other persons as well, or to wearing one which age, constant handling, use, washing, &c., has reduced to a mere rag.

“ I have, on remarking to a foreman that the children in the first room of the mill which I entered possessed no respirators, been assured that they have been constantly in use for some months, and have accordingly found that in each room subsequently inspected, the children and young persons were provided with brilliantly new ones, which in reply to my question I have been naively informed had been ‘given to me five minutes ago, Miss,’ and with which more than one little one was struggling as with a mysterious object, uncertain upon which part of her person to wear it.

“ A child is too young to form a new and strange habit, even, for its own good, unless it is for some time strictly enforced, and to plead, therefore, that it is the children’s own fault that, as they alone are benefited by it, it is ‘their own look out,’ points at least to a certain callous disregard for their welfare. This is the more noteworthy when it is remembered how strict is the discipline, and how instant the obedience required from these children on other points respecting their work in a mill.

“ I received verbal complaints as to the pattern of respirator, and saw cases of sore lips, which it was alleged resulted from its use, owing to the rubbing against the mouth. I suppose there is no objection to the substitution of another pleasanter or more efficient pattern by any employer who really considered this an objection.

“ I found an exceedingly good pattern in use in the carding-room of one mill, and the grown women employed there voluntarily informed me that they thought ‘this respirator was fine.’ The ‘celluloid’ respirators worn by the boys in the bronzing department of a printing

firm in London seem also to cause no trouble or inconvenience in their use."

Miss Paterson reports, on her visits to white lead factories, as follows:—

White lead
factories.

"I have recently visited the white lead factories in Newcastle. The rules are apparently better understood, but some carelessness is still evident in carrying them out and that not by the workers only. For instance, in one factory I was present while the women were washing before the dinner hour, and observed that there were no brushes in use. On inquiring into this, the woman in charge produced the brushes from a corner in which they were piled, saying that the women knew where they were kept and could have got them themselves. In another factory the packing room has an excellent hood connected with a ventilator, but on visiting during packing, I found the space under this hood entirely occupied by closed barrels. All the packing on that day was done at some distance from the hood and the white lead dust was in no way affected by it. In all factories I noticed neglect in wearing respirators. One firm gives respirators to all the workers, and takes no further responsibility with regard to the use of them, and I found in that factory blue-bed women wearing respirators and white-bed women without them. This method seems by no means the most likely one to secure intelligent observance of special rules among workers.

The rule which prohibits smoking in any place or room did not prevent the woman in charge in one factory and her assistant smoking in the room in which the workers take off and put on their dust-laden overalls. I noted also some instances of failure to change boots worn at work for others, before leaving the factory. The women who work in these factories, however, are not as a rule of the class who have two pairs of boots, which makes the observance of this rule specially difficult. It strikes me that the register of baths, &c., might be more definite in giving dates than I found it in the majority of the factories. The mere fact that the weekly bath was taken is all that is noted in some cases, the date is not given. The results of the doctors' examination, also, would be of more service to the Inspector, if more than the fact that the examination was made were inserted, for instance, if in any factory the Inspector found that an unusually large number of workers had symptoms of lead poisoning, that would clearly point to the necessity of making special inquiry into the probable causes of this. While in Newcastle I visited in their homes several women then suspended from work, and found the interviews I had with them very suggestive and likely to be of service in future.

"The history of one of these women was interesting, she was an unmarried woman, of about 45 years of age, and had had about 20 years' experience of white lead works in Newcastle. She had had convulsions in 1879 and had been suspended then, but had returned to work shortly after, and since has been employed at the same work with more or less regularity, having had several recurrences of lead poisoning which have necessitated her leaving the factory for a period, during which time she has worked at fish-curing. In 1894, she was permanently suspended from one Newcastle factory, and again, in July 1895, she was permanently suspended from another, having again had convulsions. She had not applied for employment under an assumed name, as I found from examination of the registers. Her sister had also been suspended during 1895, but I had no opportunity of seeing her. I was impressed, however, from my visit to this woman as well as

others with the importance of nourishing food for these workers. Poverty, and consequent want of nourishment, were striking features in most cases."

Miss Deane writes on the subject of lucifer match works:—

"In accordance with instructions, I have paid recurring visits to four Lucifer match factories, and have to record with pleasure the improvements in the observance of those special rules, which the nature of this industry render necessary in order to preserve the health of the workers.

"The difficulty experienced in conforming to the more important of these regulations, *i.e.*, special ventilation, and effectual separation of different departments, has impressed upon me the paramount importance of specially-built premises.

"The difficulty and expense resulting from the attempt to alter or adapt premises originally unsuitable is frequently great, and not infrequently only partially successful in attaining the required object. The point is one which applies equally to many other industries where special conditions exist, and which is more or less true of all factories or workshops.

"It would be a matter of much congratulation, if the advantages accruing from the provision of premises suitable from an hygienic point of view were as fully and universally recognised as the necessity (from a business aspect) of convenience or expediency, or of other highly specialised arrangements required in certain industries."

Miss Anderson also has paid several visits to lucifer match works, and writes as follows:—

"My experience is that even in the best works frequent revisiting is necessary to secure that lavatory appliances are continually maintained in an efficient condition. On one occasion, for example, one finds that the nail-brushes have been worn down to the wood—a satisfactory indication that the women are trying to attend to the rules laid down for them; on another occasion that the supply of basins has diminished with the wear and tear of time. Strict attention to the condition of the supply of towels is also desirable. No case of necrosis has occurred within recent times at the works I have visited, happily; but I have not in every case been satisfied that the measures taken for ventilating the boxing-room and for separating it from the dipping-room are sufficient to afford the fullest attainable degree of security. In my opinion nothing but mechanical ventilation can be satisfactory in an occupation with such terrible risk. Ventilation of the boxing-rooms by means only of windows opening at the top, whether down one side of the room or down two sides, does really very little, even in summer weather, to draw fumes away from the workers. In winter the windows are apt to be closed. The method, enforced by a decree in Belgium, whereby the boxing tables are fitted with mechanical ventilators drawing the fumes downwards from the workers indeed appears to be the sole really complete method of protecting the workers from the fumes. Rules number 3 and 4 in our own 'special rules' appear to me to afford a sufficient basis on which to rest such a requirement, *e.g.*, "effectual means" are to be taken to prevent the fumes from penetrating to parts of the factory distinct from those where they arise, and "efficient means, both natural and mechanical" for thorough ventilation are to be provided in all the rooms where fumes arise. The difficulty and cost to the occupiers would be no greater than in the case of vitric enamelling under the 'special rules' for enamelling of iron plates. I have seen also an elaborate arrangement for such mechanical ventilation, *per decensum*, in the yarn-bundling department of a dye works where yellow chromate

Enamelling of
iron plates.

of lead was used. In the works I visited, where the enamelling of iron plates by means of lead, arsenic, and antimony was carried on, I have found it necessary to direct particular attention of the employers to irregularities in connection with certificates of physical fitness for women and monthly medical inspection. These rules appear to me to be of the utmost value and importance."

**5. Overtime
and weekly
half-holiday.**

We cannot refrain from giving some expression to our hearty satisfaction with the increased protection for young workers effected by the general prohibition for them of overtime. We hope, also, we may see in the course of the year some improvement in the condition of women through the reduction in amount of overtime permissible for them, but at the same time we feel that even the utmost possible vigilance in connection with the overtime forms may fail to secure that this reduction is in every case a real one. It is probably generally admitted that the system of notices and records, carefully thought out as it has been, is not yet a perfect one. On the one hand, its alleged complications offer a ready excuse for employers when cases of real irregularity are brought into Court, an excuse which appears to have weight to anyone not yet familiarised with their appearance; on the other hand, it is not always an absolute check.

On this subject Miss Paterson writes:—

"I beg to draw attention to the difficulties attending the multiplicity of forms referring to this exception. The employer seems to consider that the important thing is to send notice to the District Inspector, the other forms being trifling matters, while my feeling is that attention to the overtime record is of at least equal importance, as keeping the workers informed of the overtime worked, and also showing the same to the inspector on a visit. I cannot avoid suspecting at times that an entry has been made in the overtime book in the office, while I have been in the workshop. Wet ink proved this to me on one occasion at 9.30 p.m. If the book No. 40 and record were combined, so that one person was responsible for both, much confusion would be avoided. In a case I reported to you recently, and in which you approved of prosecution, I found, on visiting during overtime, that overtime work had been reported on 13 occasions; on the record 13 entries had also been made, but owing to the discrepancy in dates these represented altogether 24 occasions. The employer, who kept the overtime book in her office, was emphatic in declaring that she had sent notice on every occasion of working; the forewoman, who took charge of the record, was equally certain that she had fulfilled her duty in the matter, and the workers could give no definite information. I think this confusion would be obviated, to a great extent at least, if one form fulfilled both purposes, and was kept affixed in the workshop or factory."

Miss Abraham and Miss Deane both remark in connection with the subject of overtime that the question of the forms in use is one which is constantly pressed upon their attention:—

"In spite of the care taken in drafting these they still prove frequently ineffectual in checking the actual amount of overtime worked, while their apparent complication frequently affords a plausible excuse when prosecutions for illegal overtime are instituted.

"There is, in our opinion, no doubt that the notice recording overtime affixed in the workshop is the most important of these forms, and we would suggest that if the notification which it is required should be sent to the Inspector were attached to this record, so that the two combined made a publicly exhibited register with counterfoils, a great

deal of the complexity would be obviated. This could be done by attaching the register (suitably modified) to a roller with each counterfoil numbered in large figures visible at a distance, the whole to be hung on the wall of the workroom.

"At present the notice which should be sent to the Inspector, and that required to be exhibited in the workroom are frequently, and in a large establishment often necessarily, in the charge of two different persons; the natural effect of this dual arrangement is to afford at least an easy opportunity for escape from responsibility."

With regard to overtime itself, as distinct from control of it, Miss Paterson continues:—

"In visiting workshops my attention has as formerly been much drawn to it, and I can only repeat again that I consider overtime an evil. Further experience has shown me that, even when extra work means extra pay, overtime is felt to be a hardship by most workers, and I am confident that much good will result from the reduction of the occasions on which overtime may be worked, and also from the prohibition of it for young persons. The extension of the Act to include employment as a shop assistant when that is combined with employment in factory or workshop is specially important, and will enable many cases to be dealt with regarding which complaints have been received."

Miss Anderson is anxious to draw attention to the great value that would be attached to a statistical treatment of the information relating to overtime. She says:—

"The point is illuminated by an instance drawn from the annual report of the Chief Imperial Inspector for Austria. He publishes a classified list of industries showing for each the number of permits for overtime, the number of factories, and of the workers affected. He then states that a comparison of the registers for different years reveals the fact that it is almost without exception the same firms who make the application year by year, whilst other firms in the same industry find the maximum eleven hours day sufficient; further he affirms that a close examination of the conditions urged by the firms making a claim to overtime leads to a conviction that these conditions do not afford a real justification for the exception. 'Overtime is by hypothesis an exception, but the employers, by a recurring demand for it, turn it into a rule.' This opinion, based as it is on carefully compiled statistics, brings surely a strong re-inforcement of the opinion held here by H M. Inspectors of Factories, almost unanimously, that overtime (apart from the treatment of perishable articles) is an unnecessary evil. The divided state of public opinion on the subject recently shown would surely have been less marked had there been any available statistical information on which to rest conclusions. The statistics ought to show the kinds of industry in which employers most avail themselves of the exception, as well as the number of factories and workshops and nights on which overtime is worked. If further we had information showing the proportion of employers who do not avail themselves of the exception (where permitted) and the seasons at which overtime most occurs we should surely be far on the way to a final settlement of the matter. At least some light would be thrown on an opinion common amongst workers that overtime results from incompetent management."

We continue to note, with many regrets, the disadvantages of the short weekly half-holiday in the occupations to which this exception applies.

Miss Paterson writes:—

"For either rest or recreation a half-holiday which does not begin until four o'clock is sadly inadequate, and I find it is felt to be so by the

workers themselves. There are now many cheap excursions from large towns on Saturday afternoons for the greater part of the year, but how can these be made available for the worker who is hard at work until four o'clock? I feel sure that compulsory closing at two o'clock would show excellent results in increased vigour and energy. The allowance of half an hour only for a meal on this day, I also think insufficient. Owing to the shortness of the time it seldom admits of workers going home, and consequently tea is partaken of in the workshop. By the time they go home after four it is almost tea time again, and so no dinner is had at all on the half-holiday.

"In connection with this I should like to call your attention to the practice of some employers of prohibiting workers leaving the premises during meal times. Through a fear of unpunctuality in returning I find this often done, and consider that the employer in doing so is going beyond his legal powers, the meal times really belonging to the worker, to be used as she chooses. The question is an interesting one and has several times come under my notice."

6. Employment of children and young persons.

The enforcement of the regulations for the special protection of the children and young persons who form so important a proportion of 'protected workers' has occupied a large share of our attention.

In view of the fact that the future physical and moral development of the industrial population depends largely upon the conditions under which this section of it works while at the most critical and impressionable age, it is evidently impossible to over-rate the importance of every measure which tends to produce wholesome or beneficial conditions. A great deal still remains to be desired in the matter of the supervision of half-timers and young persons and the conditions under which they work. As will be seen by the account of our separate experiences, the subject is one to which employers might devote considerably more attention.

We have had frequent occasion to remark the laxity of employers in obtaining certificates of physical fitness of children and young persons for employment, and in several cases we have obtained convictions for employment of young persons after certificates had been refused by certifying surgeons.

It seems a not uncommon opinion that this is merely a technical formality, and one which, if fulfilled some considerable time after the child or young person has been in constant employment has received quite sufficient attention.

In this connection Miss Abraham and Miss Deane remark that they have found young persons whose delicate health precluded them from school attendance employed in a factory without any certificate of fitness.

Miss Deane adds :—

"I may quote the case of a little girl of 14 years, who, owing to weak health and nervous disease had been exempted since the age of nine from school attendance, and whom I found employed without any certificate in a factory where the noise was deafening and where the hygienic conditions had been a subject calling for decided alterations."

Miss Paterson writing on the question of employment of children observes :—

"Numerous representations on this subject have been made to me during the year, and from these as well as from my own observations I have found much in the conditions of half-time employment that calls for improvement. Considerable laxity seems to obtain in many factories in the employment of children, several cases having come under my

notice in which a weaver or winder had brought in a child for a few days at a time, apparently without the sanction or knowledge of manager or tackler, and consequently without school attendance book, or having name entered in the factory register, and there is often much difficulty in finding out just how a long a child has been employed in this way. Much vigilance is required in dealing with half-timers, regarding whom no one inside the factory seems to feel any special responsibility. In one town in Lancashire you will recollect I found several children employed who had been refused by the certifying surgeon, and in one case prosecution followed.

"Both for the female child and the female young person at least, it seems desirable that some limit should be placed on the load she is allowed to carry. I have taken burdens from the arms of children both in Dundee and in Lancashire, the weight of which went far to account for the stunted forms and drawn faces which are to be seen among the young people in factories there. Miss Anderson in her report last year notes this as one of the regulations which France, with her care for the young, has seen reason to enforce. I have had my attention drawn also to the effect of factory surroundings on children, the abusive and profane language of which they hear so much, and the 'driving' to which they have to submit. There is no doubt that in many factories the half-time workers are the victims of numerous tyrants, and what appears to be required to remedy this is the appointment of a woman in each factory, who would derive no pecuniary benefit from the amount of work turned out, but whose duty it would be both to protect and to 'overlook' the half-timers.

"The views taken by school teachers as to the meaning of the term 'unavoidable cause' preventing a child attending school (section 23 (b) Act 1878) differ widely. In a town in Ayrshire 'washing day at home' was given as a sufficient cause and non-attendance excused, and I have noted many other similar reasons which seemed to resolve themselves into the fact that the child had to stay at home to 'mind' the baby. Non-attendance at school for these reasons, I need hardly say, is much more frequent than non-attendance at the factory."

An extreme instance of the abuse of power towards young workers, which may arise where the frequent presence and vigilant supervision of the employer with a due sense of responsibility is wanting, came to our notice in a complaint which was investigated early in the year by Miss Anderson. Unfortunately it was one of those cases in which we can do nothing but investigate and urge upon the attention of the employers the serious disgrace to them of the circumstances revealed.

The main features of this case were that an incompetent managing foreman had, nominally as a means of discipline, but under circumstances of special risk created by his own and his colleague's flagrant mismanagement, turned a great fire-hose on to a large group of young tenters and weavers, the water used being, as they stated, indescribably filthy and drawn "from the mill lodge" (pond). The bulk of the water was directed over a partition upon them while they were jammed in a narrow vestibule in which they took refuge and which was enclosed, on one side by a locked door, on the other by a swing door opening inwards. The girls, of whom 40 were examined by Miss Anderson, were then turned out on a cold March day (of 1895), dripping, to walk in some cases several miles to their homes. An attempt was made by the managing foreman to put a gloss on the matter by showing a warm room near the boilers to Miss Anderson as being the women's cloak room, suitable for drying shawls in wet weather. Further inquiry proved that this room was put at the disposal of the work-women after the events referred to, when indignation

had run very high. In a subsequent interview with the secretary of the company Miss Anderson was informed that the foreman had been reprimanded, had made an apology, and that nothing of the kind was likely to occur again. Nothing further could be done by our Department in the matter.

With regard to the age of children employed in factories and workshops, although we could have desired an alteration of the law in 1895 which might have brought England up to the level of France and Austria in the control of child labour, and, while we feel that some reform in this direction must before very long be attempted, we are anxious to express our hope that when an alteration is made it will be of so thorough a character that it really effects its end. A simple prohibition of employment, without any increased control of the movements of the children through improved requirements as to school attendance, may simply mean that the children pass into uncontrolled occupations, for instance, as household drudges, errand boys and girls, newspaper boys, butcher boys, milk boys, sweepers, &c. in shops. Any change would be most undesirable, which merely tended to swell the ranks of these classes of workers with the children who are now at least under some kind of supervision. As matters stand, however, we are continually the recipients of accounts from teachers and those interested in the training of the children, of the dangers of deterioration of character and manners under the half-time system. Our attention is frequently drawn by teachers to individual cases of serious injury to health through the double strain put upon children in this way.

7. Fines and deductions.

The systems of fines and deductions imposed upon workers are the cause, as heretofore, of frequent complaints to us, and we have been disagreeably impressed by the arbitrary manner in which these are inflicted by foremen and other deputy authorities, and by the uncalled-for amount of secrecy exercised upon the subject. This lack of publicity in the application, the amount and the purpose to which the sums thus collected are devoted, constitutes a serious objection to a system which there are many reasons for considering an unnecessary one. We have found firms employing large numbers of persons in which the discipline was successfully maintained without recourse to this method.

Miss Deane reports :—

“The following is an example of the ‘charges per head,’ found when visiting a factory.

“ 4*d.* per week for ‘room’ (*i.e.*, cleaning).

“ 2*½d.* a reel for thread.

“ 1*d.* per needle.

“ $\frac{1}{2}d.$ in the shilling earned for ‘power.’

“ 3*d.* a week for the gas used in the gas-irons, by each ironer. .

“ Here is another instance :—

“ 2*d.* per room.

“ 2*½d.* a reel of thread.

“ 3*¼d.* skein.

“ 1*d.* for every five minutes late, piece-workers.

“ 3*½d.* wages book.*

“ I have seen a dining-room which is shown to visitors as an example of the beneficence of the firm with a gas stove in it, and a woman employed to keep it clean; subsequent questioning elicited the fact that the

* Subsequently stamped with name of firm and claimed as their property.

weekly deductions from 200 women supplied a large proportion of the funds which maintained this 'generous' arrangement.

"Many are the complaints in clothing and other industries of deductions for thread and other materials used. Those employers who, in accordance with this peculiar custom, require the worker to supply part of the material used by and for the profit of the firm, allege that it tends to prevent waste; by those who have discarded the practice I am informed that with proper supervision no appreciable waste has resulted.

Even in cases where the discarding of the habit results in nominally lower wages, this latter course would appear simpler and less open to abuses of all kinds."

Miss Anderson reports:—

"I continue to hear frequent complaints of fines, charges for materials, and power, and various deductions from wages, more especially the fines for damages, on which I laid stress in my report last year. I can only repeat my opinion, there expressed, that the matter is one which presses for further regulation, and draw attention afresh to the German regulation of the abuses (*cf. infra* p. 180). I have been interested to find one case in a clothing factory of a restoration to the workers of the proceeds of disciplinary fines in the shape of an annual bonus. This is so far good, but what is further required, if fines are to be admitted at all as anything but a violation of the principles of the Truck Acts, is: (1) publicity in the system of levying them; (2) strict limitation of their amount; (3) that subordinate officials shall have no power to levy them or determine their amount. The experience of the best firms that fines are unnecessary, gives support to another view that absolute prohibition of fines is the better course. No species of charge on wages seems to me more reprehensible than that which lays upon the workers the duty of either paying charwomen for keeping the lavatories in order, or of themselves taking turns, in work hours, at their own loss, to do the necessary cleaning."

The first point, in our experience with regard to the extension of the Factory Acts to laundries is the manifold expression of a conviction amongst employers in this industry that a great advantage is to be confidently expected in every class of laundry, except perhaps the one to which the speaker belonged. In steam laundries, however, the satisfaction of employers is practically universal. A general view also appeared at the same time that the effect of the Acts would be to steady and organise the laundry workers.

The second point in our experience is the wide-spread feeling amongst workers that a boon has been conferred upon them in the extension to them of some legislative control of their conditions.

Miss Paterson, writes:—

"The enforcement of the regulations for the guarding of machinery and the sanitary provisions will be of benefit, and no doubt more regular hours of work will result in many laundries, but the very elastic nature of the restrictions as to hours of work and meal times will make the detection of illegal overtime exceedingly difficult. The exclusion of the smallest laundries will probably lead to the multiplication of these, and to excessive hours in them. One laundry keeper frankly avowed to me her intention of reducing her staff from three to two, and working longer hours, to avoid inspection. Some exact definition of what constitutes a 'member of a family' would be of value in this connection. In visiting laundries for the purpose of preparing lists I was the recipient of many expressions of opinion on the subject, and found

8. The Act
of 1895.
a. Laundries.

much indignation expressed at the exclusion of the small laundries; I think this feature of the Act had scarcely been realised by laundry keepers generally.

"The general feeling, so far as I had opportunities of testing, is that there would be little difficulty in having regular hours of work if they could secure the co-operation of their customers, and so be able to have both washers and ironers employed from Monday.

"The feature of the Factory Act which seems to appeal most strongly to many workers is the Saturday half-holiday, and the information which unfortunately I had to give them on that point called forth many expressions of disappointment. 'What is the good of a Factory Act like that?' said one woman."

Miss Deane observes:—

"I have been made the recipient of the views of a very large number of laundry women and their employers upon the subject of the inclusion of laundries under the Factory Acts. I remarked that even among those employers who objected to their own inclusion under these regulations there appears to be a decided opinion that the Act would tell beneficially among those engaged in a different branch of the trade. Thus the 'hand-laundry' owner seemed convinced that the restrictions upon long hours and the compulsory fencing of machinery was imperative for steam laundries, while the steam laundry proprietor rejoiced that the insanitary conditions obtaining among certain hand laundries would be abolished. The regrets were almost unanimous, and were constant, that the Act was not extended to all laundries. 'Why may a man work his own children harder than other folks?' and 'Why may clothes be washed under dirty conditions next door where only two women are employed, while I, who employ three, must set my house in order and conform to regular hours?' were questions I was continually asked.

"The actual hours now worked in any laundry rarely amount to the maximum number sanctioned under the new Act, which allows an unlimited elasticity in the matter of their distribution over the 24 hours, day and night. Thus, if two hours are given for meals I found it was seldom that a longer period was required than from 8 a.m. till midnight for women—a period now approved by law.

"Among the women employed, when they spoke about it at all, I found no aversion to the Act, and the following is a typical incident: The door of a hand laundry at which I knocked opened directly into the ironing-room, and the woman who replied to my summons, requested my name and business that she might go and inform her mistress; I told her, and the irons were instantly put down to admit of a hearty clapping of hands among the listeners followed by exclamations of pleasure, and an entreaty that I would 'listen to what they had to say,' as well as to the statements of other 'folks who objected.' In most cases where aversion was shown I found the densest ignorance as to the object of the Act, many being of opinion that it 'meant a yearly subscription' or the 'raising of the rates.' The ill-drained floors of wash-houses, resulting in much unnecessary dampness, and the excessive heat of those ironing rooms, which in winter are also used as drying-rooms, were the subjects of frequent complaint."

Miss Anderson reports:—

"I have certainly been astonished by the spontaneous, heartfelt expressions of gratitude and thankfulness from young laundresses for the anticipated benefits of legislation on their behalf, and the quieter hope of coming good amongst the older women. I have not found yet

among workers a trace of the antipathy to regulations which has been rather widely supposed to exist. Some young ironers, who had been working for some days from 6 a.m. to 12 p.m. (with intervals), at the time I spoke to them, remarked to me 'A lady asked us why we did not refuse to work such long hours, but what did she know! Their further opinion that 'now' their employer would 'learn what law means' led to an explanation, which they found depressing, that their hours could not be reduced to the limits of their friends' in the textile factories, as they fondly imagined."

One of our chief anxieties has always been to afford every opportunity (b.) Personal for personal communication with workwomen to answer inquiries and interviews with give every information and assistance that it is in our power to give. The desirability of increased facilities for such communication is heightened by the need for extending a knowledge of the chief provisions affecting women in the Act of 1895. It is at all times possible for us to make appointments, at request, for evening interviews in the various industrial centres we visit, and we should like, with your permission, to take this opportunity of publishing the fact that one of our number is in attendance at our office at 8, Finsbury Circus, London, E.C., every Monday from 7 p.m. to 9 p.m., and that we can make appointment there for any other time."

We have the honour to remain,

Sir,

Your obedient servants,

(Signed) MAY E. ABRAHAM.
 MARY M. PATERSON.
 LUCY A. E. DEANE.
 ADELAIDE M. ANDERSON.

To R. E. Sprague Oram, Esq., C.B.,
 H.M. Chief Inspector of Factories.

COTTON CLOTH FACTORIES ACT.

Mr. E. H. Osborn, H.M. Superintending Inspector, who has charge of the administration of the Cotton Cloth Factories Act and special rules in flax mills, reports as follows.—

"During the past year the Act has been fairly observed in general, and the statutory notices fewer in number, although they are now issued in all the minor cases of irregularity. As a rule the instruments are kept in correct working order with great care, and when found otherwise, this arises from their having been entrusted to some novice, insufficiently instructed in their management, which necessitates pointing out that the readings must be taken by the 'occupier, manager, or person, for the time being, in charge of the factory,' a very important provision for ensuring due responsibility. In some cases where the limit is exceeded according to the record, it is alleged that the reading has been erroneously entered, but the occupier is always informed that this excuse cannot be accepted, and that the entry must be taken as correct, by the terms of the Act.

"Comparatively few complaints have been received, either by myself or by the Inspectors who assist me. They are generally transmitted through the local secretaries of the operatives, who of course forward them as they receive them, and are in no way responsible for their accuracy. They receive prompt attention, and the places delated are visited on several occasions at short intervals, though it is clear that in

some cases the alleged circumstances are physically impossible, and would practically prevent manufacture. At an interview with some of the leading representatives of the operatives last winter, in order to meet all contingencies, and to ensure the utmost possible despatch in investigating complaints, I undertook that if a telegram reached me or my assistants in time any day, the matter should be dealt with at once, specially, on the same day, and I would pay the cost of the message: but as we have not received any intimations through this channel it may be inferred that urgent cases have not arisen.

"Within the 12 months from 1st November 1894, some 30 complaints in all were received, and were duly inquired into by the inspectors in the district I referred to, or by myself. It is noteworthy that in no cases are the readings of the instruments given in support of the statements made, and that some complaints refer to interference with ventilation, which seems to be better appreciated as time goes on.

"The amendment of the section relating to ventilation will cut away the grounds for misunderstandings as to its scope; and for all excuses, whether true or not, that the infractions in this particular have arisen from the operatives themselves, who have claimed to control the arrangements in the direction of preventing the continuous supply of the minimum of 600 cubic feet of fresh air per hour per head. Enquiries into these irregularities have elicited that in many instances the fault has lain with the weavers, but in others, notably a case at Macclesfield, where I was informed the operatives had free access to the roof of the shed, and closed the ventilating apertures outside, investigation satisfied me the statement was entirely untrue.

"I am glad still to be able to report that during the whole six years that the Act has been in operation no prosecutions have been requisite in the matter of ventilation; slight difficulties have occasionally occurred where occupiers have been misled by assurances from inventors of humidifying apparatus that these were also effective ventilators, but these difficulties usually disappear when the terms of the Act are made clear, and the alternative, which is our last resort, is fully understood.

"The benefits conferred by this part of the Act cannot be overrated, and are now recognised generally by employers and managers, owing to the marked diminution in sickness among the workers, and their greater briskness, which means better work. Already some firms are adding to their appliances in this direction, and extending the principle to other departments of the mill.

"Sometimes, however, the old prejudices appear to linger, and when a place withdraws from the Act, we find the fans are stopped, the straps removed, and the openings covered with sacking. For this reason we notify withdrawals to the district inspector, that the ventilation may be kept up under the general Act; otherwise there would be a relapse to the bad old system, which still prevails in the "dry" sheds, where in winter the air is probably not changed once in the day, and the dry and dusty atmosphere, impregnated with the excreta of the human breath, and the unwholesome products of gas combustion, becomes oppressive and undoubtedly injurious. It is to be remembered that an adult gives off in 10 hours of work 6 cubic feet of carbonic acid gas. If we take, then, a shed of 1,200 looms, and 400 weavers with 2,000 cubic feet of space apiece, they will evolve in the day's work 2,400 cubic feet of carbonic acid gas into the 800,000 cubic feet of space they occupy; this will be equivalent to 30 parts of CO₂ to 10,000 parts. In such a shed there will be 600 gaslights, each burning 3 feet of gas per hour for 3 hours on a winter's day, and producing 6 cubic feet of CO₂, an

aggregate of 1,200 cubic feet, equivalent to another 15 parts per 10,000, or an aggregate of 45 parts to 10,000 in the day. Add 'the organic matter also given off from skin and lungs, which is partly suspended, and made up of small particles of epithelium and fatty matters detached from skin and mouth, and partly an organic vapour given off from lungs and mouth,' and some idea may be formed of the breathing conditions of inadequately ventilated sheds, especially in the winter months, seeing that the accepted standard of permissible maximum impurity is 6 parts of CO₂ in 10,000.

It would establish effectively hygienic conditions on a really scientific basis if the State were to fix a standard of permissible maximum impurity of 8 parts of CO₂ in 10,000, which would incidentally secure adequate ventilation, irrespective of cubic space (which is no criterion of wholesome conditions by itself), and it would then be easy to deal with any unhealthy attributes special to certain industries. The chemical analysis of air would rest with the medical officers of health, and the public analysts, who are *ex officio* competent witnesses, and might be set in motion, if necessary, by the Inspectors in the same way as the local authority is now in certain cases of sanitary defects. With a revised form of death certificate, giving fuller detail of industrial occupations during life for both sexes, and perhaps accessible to the local medical officer, it would become possible for this country to produce a valuable body of statistics relating to its industries, worthy of their magnitude and importance, but at present unattainable.

"As there has recently been some agitation against the use of steam to condition the atmosphere, having for its object to set aside the Cotton Cloth Factories' Act (which was the result of conferences and compromise between the manufacturers and operatives in 1889), and practically to make illegal and abolish the production of an artificially humidified atmosphere for manufacturing purposes in all spinning and weaving factories, it may be permissible to touch upon the question with some detail, though perhaps recapitulating observations made in former reports.

"As to humidity, apart from any manufacturing considerations, it is an acknowledged truth that the most agreeable atmosphere, to healthy persons in general, is when the relative humidity is between 70 and 80 per cent., as this percentage permits free, without excessive evaporation from the body.

"De Chaumont considers 82 per cent the most desirable for our climate, and other authorities reckon 5 degrees as the maximum difference desirable between the wet and dry bulbs, and it has been noted that a hot dry atmosphere, more particularly when dusty, causes irritation of the bronchial passages and cough, and in the long run may induce disease of the lungs. I may quote Dr. Barr, the experienced certifying surgeon of Bury, and medical officer for the rural sanitary authority, who says, 'I am of opinion that work in many weaving sheds would become intolerable in case the relative amount of humidity was superseded by a warm dry atmosphere.' All reading comprises this view, which receives further confirmation from observation of the death-rate of spinners, who, as shown in a series of analyses of the air in spinning rooms, work under fairly favourable conditions of atmosphere so far as organic purity goes, but are subject to dry heat, more especially in the fine spinning mills, the relative humidity of the rooms being sometimes as low as 34 per cent. Also, wherever a dry atmosphere prevails, the dust evolved in manufacturing processes is largely increased in volume to the detriment of the workers, as was illustrated in my Rochdale experience by cases that came to my knowledge where cotton weavers

who had acquired chronic bronchitis from working in the dry and dusty weaving sheds, abandoned cotton for the woollen mill (where the fibre is treated with oil), lost their chronic cough and in a year or two became physically regenerates.

"The independent testimony of Dr. Wheatley's report on the health of Blackburn for 1894 may well be represented here, as Blackburn is the chief weaving town, and artificial humidity is produced, mainly by steam, in all but one or two sheds. Dr. Wheatley observes (p. 47.) 'The proper ventilation of weaving sheds has undoubtedly proved to be a great benefit to the workpeople, and might very advantageously be extended in some form or another to most other parts of the mill ;' and 'the figures of last year are very much in accordance with those of former years. They seem to show the healthiness of weaving for young persons ;' and 'this year's figures like previous years show that the death rate of weavers is lower at every age period than those of spinners, and that, with the exception of one period (over 65) they are lower than those of the rest of the borough.' As all who survive 65 must die over that age this exception is not unfavourable to the weaving class.

"I reproduce his table.

DEATH RATE FOR 1894.

Age Periods.	Weavers.	Spinners.	Winders, Warpers, &c.	Card Room.	Other Cotton.	Borough.
15 to 25	4·6	7·7	4·8	..	9·2	4·7
25 to 35	6·3	6·2	10·4	6·8	4·7	6·5
35 to 45	6·0	8·2	11·5	5·4	8·0	11·9
45 to 55	11·1	46·2	12·9	10·8	6·7	22·2
55 to 65	29·8	27·5	35·4	..	56·9	40·0
65 upwards	180·4	173·9	217·3	153·8	266·6	92·8

"For rough comparison I subjoin the death rate as calculated for us in 1883 at Somerset House for the years 1875-1882, both inclusive, with the Blackburn death rate, from Dr. Wheatley's tables, for the years 1889-1894, both inclusive, and giving death rate for 1894, all of weavers only, with borough.

"These figures are interesting as indicating apparently steady amelioration; it must be noted that the Cotton Cloth Factories Act only came into force in 1890.

Age Periods.	1875-1882.	1889-94.	1894.	Borough.
15 to 25	6·45	4·3	4·6	4·7
25 to 35	9·5	5·0	6·3	6·5
35 to 45	15·2	10·4	6·0	11·9
45 to 55	24·1	14·6	11·1	22·2
55 to 65	45·9	58·1	29·8	40·0

"A point of special interest attaching to Dr. Wheatley's figures for last year is that he has taken pains to arrive at the statistics for women inclusively. The defective nature of the death certificates for married women in relation to occupations constitutes a serious obstacle to accuracy of statistics upon industrial death rates.

"As it is alleged that humidity in weaving sheds contributes to increase phthisis, bronchitis and pneumonia, it is desirable to give the tables for the years 1889-94, both inclusive, from the same report.

DEATH RATES—PHTHISIS, 1889-94.

Age Periods.	Weavers.	Spinners.	Winders, &c.	Card Hands.	Other Cotton.	Borough.
15 to 25	1·1	1·9	1·5	1·6	0·9	1·4
25 to 35	1·7	2·2	3·5	2·0	1·5	1·3
35 to 45	1·7	3·0	1·7	3·6	3·0	2·2
45 to 55	1·7	3·0	0·4	5·0	2·2	1·9
55 to 65	3·8	..	1·1	..	1·3	1·3
65 upwards	..	3·6	7·2	..	5·5	0·5

BRONCHITIS AND PNEUMONIA, 1889-94.

Age Periods.	Weavers.	Spinners.	Winders, &c.	Card Hands.	Other Cotton.	Borough.
15 to 25	0·9	1·3	0·7	0·3	1·8	1·0
25 to 35	0·9	2·9	0·4	1·1	1·5	1·7
35 to 45	2·8	3·3	3·6	2·2	3·0	4·3
45 to 55	6·2	14·6	9·0	10·8	6·1	8·6
55 to 65	21·8	35·6	11·8	14·3	28·4	19·5
65 upwards	73·3	79·7	68·8	102·5	100·0	37·4

"These two tables bear out what has already been remarked as to the disadvantages of too dry an atmosphere, as exemplified in the case of spinners.

"Some remarks from a letter I have received on the subject from Dr. Dunbar, long the certifying surgeon in Blackbnrn, may be appositely introduced here. He writes:—

"From personal experience and observation I am decidedly of opinion that the Cotton Cloth Act has very considerably modified, and almost obliterated, some of the ailments weavers suffered from 20 years ago. There is far less rheumatism, chest complaints, sore eyes, and typhoid fever. They have a healthier and more cheerful look about them, and on a Sunday afternoon and evening, well-fed and well-dressed they promenade up Preston Road. I am sure no town at home or abroad can boast of a finer display of growth and beauty, which I failed to notice five and twenty years ago. I entirely coincide with the opinion expressed by employers and managers that there are fewer workers off sick than used to be. I noticed in the papers a few months ago an agitation in Burnley for abolishing steam. It will be a weary day for the health of the weavers if that agitation is successful.

"The leaders in this movement are apt to lose sight of this important fact that a dry atmosphere from 60° to 80° is deleterious to both animal and vegetable life. The sallow countenances of the card and spinning room hands are caused in a great measure by a dry atmosphere."

"Facts and observations alike, therefore, appear to point decidedly to the advantage to health of a reasonable humidity over a dry atmosphere,

nor is there any ground for supposing steam *quâd* steam to be an unsatisfactory mode of producing such reasonable humidity. Indeed all humidity of atmosphere must be produced by vapour, and steam is the form of vapour which more rapidly coalesces chemically with air than any of the mechanical forms of water-spray, for obvious physical reasons. In the earlier stages the fault associated with its use was that it was introduced in uncovered pipes, which, radiating a heat equal to that of the steam they contained, which was also sent in at boiler pressure, practically defeated the user's purpose, by drying the moisture out as fast as it was put in, and raising the general temperature. This has been remedied by utilising section 9, which does not allow temperature to be raised artificially (excluding effects of gas) above 70° 'unless necessary to humidifying,' and as drying the air as above, is clearly unnecessary in humidifying, we have required these carrying pipes to be covered with non-conducting materials, of which there are many very effective, as well as pointing out the better effects of low-pressure steam, which is, of course, of lower temperature than high-pressure steam, according to definite ratios, as well as more economical, a point Lancashire manufacturers are not likely to lose sight of in their own interests.

"The late movement appears to originate with a small section of the older weavers—*laudatores temporis acti*—who picture to the well-meaning ignorance of their fellows a golden age, that never existed, even before the American war, when short-stapled Indian cottons were unknown, and the sciences of cotton mixing and sizing for weight not developed by necessity. Handloom weaving in cottages was always carried on in ground-floor rooms with earthen floors, and a trough of water under the beam for humidity: and the older weaving sheds were built partly in the ground to ensure damp floor and walls, while the practice of watering the floor was carried to such an extent, that the workers splashed through water to their work, and the overlookers had to carry planks with them, for use when they had to lie on the ground to 'tackle' a loom. These circumstances are well within the remembrance of those who were familiar with them 50 years ago, and so far as I have been able to learn from aged weavers with whom I have talked at various times, rheumatism, bronchitis, asthma, and kindred ailments seem to have been autochthonous, and to have flourished.

"It is manifest that employers are not to be deemed responsible for all these ills to which Lancashire is peculiarly heir by reason of its soil, climate, and the carelessness of its population, especially in youth, in matters of health, food, and clothing, which have come under my observation while living in the midst of them. Here is a description of Darwen from its medical officer of health, which applies equally well to many Lancashire districts:—

"In this district we have a very heavy rainfall, probably about half as much again as the average for all England and Wales; secondly, throughout the town there runs a heavy stratum of clay sub-soil, which prevents the percolation of the water to any depth into the land, thus keeping the soil in a state of heavy moisture, which, by evaporation and the coldness of the clay, renders the atmosphere both cold and damp, no mean factors in the causation of such a disease as bronchitis."

"The genesis of some of the erroneous notions prevalent among operatives and others may be briefly traced. The most common originated from the form of Schedule A as it first appeared in the Act, from which it was inferred that, as at 60° 5·1 grains of vapour per cubic foot were allowed, while at 95° 11·5 grains were permitted, this

meant that the air at the higher temperature would be twice as moist as at the lower. The truth being that the air at 95°, with its allowance of vapour is less moist than the air at 60°, with its 5.1 grains, by 22 per cent., the percentage of moisture at 95° dry, 87° wet, being only 66 per cent., as against 88 per cent. at 60° dry, 58° wet.

From this misunderstanding they argued it was the employer's interest to raise temperature as high as possible to get the larger amount of moisture, whereas his interest lies entirely in the opposite direction, and especially for economy's sake.

"To make this clearer, the column of percentages of saturation was added to the amended Schedule in 1893.

"Another erroneous view, very common, is that the high summer temperatures of the sheds are brought about by the employer for humidifying purposes, whereas they are due to the action of solar heat upon the configuration of the roofs of these buildings, which are nearly half glass and half slate, and therefore present a large and very sensitive surface to heat or cold, and frequently face the wrong aspect.

"Through the kindness of two employers in different parts of Lancashire, I receive records of the external heat, taken on the outside of sheds by a solar maximum thermometer (black bulb in vacuo), and in June and July this recorded sun heat ranged as high as 120° and 133°, a height which would render a lower temperature than 80° to 90°, according to aspect, unattainable, even with the generally adopted precaution of whitening the glass and slates.

"On such days, when, as I have pointed out, the humidity has been only 54 per cent. instead of the permissible 72 per cent., the dryness of the air induces copious perspiration with its concomitant lassitude, and the weavers' bodies become wet thereby, but this has been attributed to excessive humidity, while arising from the very opposite.

"The abolition of artificial humidity, which is now generally recognised in all manufacturing countries as essential to the successful working of textile fibres, would accentuate this discomfort.

"I have purposely omitted any arguments on the uses of humidity from the manufacturer's point of view, and have dealt with it solely as a question of public health, but I may now append a letter received from a manager, which incidentally disposes of another very common misunderstanding, to the effect that steam is rendered requisite by excess of sizing. He writes:—

"‘I can give my experience, having worked as a cotton weaver, loom tackler, and manager over 40 years. I find that most steam is required for medium (*i.e.*, moderately sized) cloth. It is a cloth that is wanted “hard” and “dry” in feel, say from 135 per cent. to 140 per cent. A very large quantity of this cloth is made in Lancashire. The very heavy cloth from 200 per cent. to 300 per cent. requires less steam (owing to the susceptibility to moisture of the deliquescent salts). Then we have what is known as pure sizing from 5 per cent. to 15 per cent., this cloth will mildew if sized damp enough to weave without humidity. I can refer to our own place for all these cloths. Take a place like Mr. ——’s, who has never sized anything but pure, his average has gone up considerably since he began to steam. It has also a tendency to make healds and reeds last longer.’

"His firm makes a large quantity of cloth for India, which trade would be completely killed by the abolition of humidity. He also informs me there was no sickness in his mill during the past winter; a point which in our view is of great interest.

"It may be useful to deal with some of the mistaken ideas which have gathered round the subject, whether from ignorance of the facts, or from misrepresentation.

"Here is an extract from an editorial article in a textile monthly. 'There is an absolute difference between humid air and air filled with water vapour, which is what steam rapidly becomes when ejected.' Steam has been usually supposed to be water vapour. Again, 'It is not the presence of humidity in the air which is detrimental, it is the existence of moisture.' The words in italics are synonymous terms.

"The medical officer of health of a town where fine spinning is carried on, and the rooms are at a very high temperature (to supple the wax constituent of the cotton fibre) and the humidity of the atmosphere abnormally low (between 30 per cent. and 40 per cent.), in his annual report attributes the death rate of spinners to the dusty and moisture-laden air of the mills, when really the air was unhealthily dry.

"Indeed the terms 'moist,' 'humid,' and 'steamed' as applied to factories seem to create an impression outside that operatives are subjected to some culinary process, or as one of their representatives at a tea meeting expressed himself, being 'almost stewed to death by Act of Parliament,' a species of misrepresentation which affords a gauge of the honesty and intelligence which puts it forward or accepts it. The general public is, of course, unaware that weaving of cotton could not be carried on with a 'saturated' atmosphere, and that the 'moisture' allowed by the Act is imperceptible to the senses, and whether derived from steam or any other method is absorbed into and merges with the air in the same way as their own breath.

"In an article from the *Cotton Factory Times*, I find—'As every weaver in steamed sheds now knows it is the universal custom to damp the air right up to the limit allowed them and keep it there.'

"But I showed in a previous report that the average limit used was $2\frac{1}{2}$ degrees below that allowed; and that in less than 20 per cent. only of the sheds was the limit reached, and this appears equally true now.

"It continues: 'The ignoramuses who manage most of our sheds, have kept pouring in steam until the air has at times reached 100 degrees.' There are no instances of a shed reaching 100 degrees of temperature; and from the general tenor of the article, it seems probable that the writer has been misinformed by some ignoramus who does not manage a shed. But any stick is good enough to apply to employers.

"In a former report, I pointed out that in a hot June when the solar heat brought all the sheds to 80 degrees and over, there was no greater difference than 3 or 4 degrees, whether they were using steam, spray, or any other apparatus, or no steam at all.

"Among the various resolutions passed by branch associations of operatives, the Burnley branch attributes the high infant mortality of the town to use of steam in sheds.

"Now in Burnley the estimated total of looms is 62,000, and of weavers 21,000. Of these 62,000 looms 9,172 (less than one sixth), are in humidified factories, and these are worked by 2,605 weavers, of whom 364 (=14 per cent.) are married women. There does not appear to be any evidence that the infant mortality of Burnley is associated with this fraction of the population.

"In the quarterly report of the Darwen Weavers' Association they say: 'That the workers should be expected to toil from morn till night in a heated atmosphere of 95 degrees and humidity 87 degrees is a disgrace both to the employer who insists upon it and a people who boast of representative government, who allow it.'

"From this statement it might be supposed the Darwen operative works habitually, instead of never, under the named condition of atmosphere. But I requested Mr. Williams to take out all the days in hot months where 90° had been reached or exceeded in the Darwen district, and append the results tabulated. They are interesting, and also show the difficulty of securing uniform conditions all over a shed, and the differences between the actual and legal percentages of humidity materially confirm my opinion that the limit of humidity allowed is not generally reached.

TABLE of MAXIMUM HEAT recorded between June 1st and September 30th (both inclusive) in such of the 64 SHEDS in DARWEN DISTRICT, as exceeded or reached 90°.

No. of Shed.	—	Dry Bulb.	Wet Bulb.	Actual Percentage of Humidity.	Legal Percentage of Humidity.	Difference — or +.	Date, June.
1 {	Centre	-	90	80	59	69	—10 }
	Side	-	86	78	64	72	—8 }
2 {	Centre	-	91	83	66	68	—2 }
	Side	-	89	81	65	71	—6 }
3 {	Centre	-	91	81	59	68	—9 }
	Side	-	92	81	56	68	—12 }
4 {	Centre	-	90	81	62	69	—7 }
	Side	-	85	80	76	72	+4 }
5 {	Centre	-	90	78	53	69	—16 }
	Side	-	86	78	64	72	—8 }
6 {	Centre	-	90	82	65	69	—4 }
	Side	-	87	78	61	71	—10 }
7 {	Centre	-	90	82	65	69	—4 }
	Side	-	88	79	61	71	—10 }
8 {	Centre	-	90	80	59	69	—10 }
	Side	-	90	80	59	69	—10 }
9 {	Centre	-	90	80	59	69	—10 }
	Side	-	90	80	59	69	—10 }

The following quotation in reference to the Padiham arrangement shows an undoubted misconception as to what constitutes a desirable atmosphere. 'If a weaving-shed is heated, say to 80°, and it has in it only the moisture which the legal schedule allows for 64°, the air will, if anything, be drier than it is outside. It is on this account we say that, as matters stand, the settlement is excellent.'

Now at 80°, a temperature common in summer, from the mere solar heat, to most weaving sheds, whether humidified or not, with the moisture allowed for 64°, the air would contain only 35 per cent. of moisture, i.e., such an amount of dryness and consequent dustiness as is found in the unhumidified sheds, and is probably a main factor in the unsatisfactory death-rate among spinners.

"It is my duty to state, notwithstanding any allegations to the contrary, that there is now no hostility to the Act on the part of

employers; in fact those who were once its strongest opponents now consider it has been a valuable piece of legislation, although there is no doubt that the higher temperatures are penalised, and occasional difficulty arises when the weather is unusually hot, and the percentage of humidity must be kept low, but this arrangement, the result of the original compromise, has plainly made it contrary to the employers' interest that high temperatures should be reached, if avoidable. The provision as to ventilation, at first feared, has proved most beneficial, and has been the first step towards securing certain change of atmosphere, for which cubic space alone is no guarantee. Seeing that 3,000 cubic feet of air per head per hour is the supply postulated by science, one fifth is a comparatively small step towards perfection. When it is remembered that most of the sheds contain twice the cubic space of the House of Commons, some of them more than four and five times as much, the difficulties of ventilation are apparent. 'Natural' ventilation is quite useless with these enormous masses of air, and for various reasons the system of propulsion alone is unsatisfactory; among these, because the fine particles of fibre are retained in suspension, while analyses have shown, in such cases as have been completely tested in ordinary circumstances, over 2·0 of CO₂ per 1,000, as one would have expected from the 'stuffy' feeling of such sheds.

"As Parkes states, 'General Morin' (the great French authority) 'has pronounced the system of propulsion everywhere inferior to that of 'extraction,' and 'the danger of contamination of air as it passes through long tubes, and the immense friction it meets with, must not be overlooked.'

"I believe the judicious combination of the two principles to be the best solution of the problem, as extraction with simple inlets has already given results below 7 of CO₂ per 1,000.

"I cannot close this report without acknowledging the services of the gentlemen appointed to assist me, and their readiness and zeal in carrying out my instructions, and I am glad that Mr. Williams is retained in the Blackburn district on his promotion. Through his exertions there are now nine cloak rooms in use in that town, three outside, and some promised in other directions. Their value in ensuring dry clothes for the workers to go home in is incalculable in such a climate as Lancashire possesses.

FLAX CULTIVATION IN IRELAND.

Mr. Bellhouse, H.M. Inspector for the Dublin district, reports:—

"*Flax*.—I am sorry to have to report a falling-off both in the acreage under flax cultivation, and in the estimated production. The decrease in acreage is not of serious moment, but the decrease in production has a very ugly appearance, as the following statistics will show. For these I am indebted to Mr. Wm. Morton, the secretary of the Flax Supply Association.

Acreage under Cultivation.			Estimated Production.				
		Acres.					Tons.
1894	-	-	101,081	1894	-	-	22,061
1895	-	-	95,202	1895	-	-	12,972
Decrease	-	-	5,879	Decrease	-	-	9,089
			or 5·81 per cent.				or 41·20 per cent.

"The following remarks too, from the speech of the president, in moving the adoption of the report for the year 1894, referring to a discovery by Mr. M'Causland of a new method of steeping the flax strikes me as being of peculiar interest to the flax industry:—

"In connection with the growth of flax, I may be permitted to mention that I have lately seen a small pamphlet, entitled 'Experiments in Flax Growing,' published by Mr. M'Causland. It seems to me of so much importance that I trust it has been widely circulated amongst all who are engaged or interested in the culture of flax in Ireland. It supplies information as to the weight of flax in the green state, in the steeped state, and in the scutched state, very generally required and not easily obtained; but the principal value of the pamphlet is the history it gives of the author's experiments in steeping flax twice, according to the continental system. So far back as the year 1879 I was engaged in some interesting experiments in the treatment of Irish flax, the full particulars of which I am not going to inflict upon you at present; but among other experiments a trial was made of sending the Irish straw to be steeped in the Lys. The result of this was highly successful so far as regarded improvement of the quality of the fibre, as the flax thus treated proved worth about 1*s.* 6*d.* per stone more than that from the same straw treated at home. The cost of the transport of the flax straw unfortunately rendered the experiment commercially unsuccessful. Mr. M'Causland, however, seems to have devised a method by which the advantages of foreign steeping may be gained without the drawbacks of the cost of transit, and if, as it seems probable, he has succeeded in doing this he will deserve the gratitude of all interested in the cultivation of flax; for he will have opened to them a wide field of improvement, as well as shown them how to increase the profits of the cultivation of this crop. He tells us that for one sample of flax which he treated by twice steeping he received 16*s.* per stone, or 128*l.* per ton. Now the average price of Irish flax, taking one year with another, is about 50*l.*, whilst the best of it rarely exceeds about 80*l.* The contrast between these figures will give an idea of what margin there is for improvement in the culture and treatment.

"This system is, I understand, very similar to that adopted in Holland and Belgium, but has as yet never made any headway in Ireland, and I fancy it is hardly expected to do so till this full Belgian custom is introduced; that is the steeping and scutching is a separate industry—a class of men known as factors buy the flax straw from the farmers, sort it carefully, and steep it during the following summer months. This would, of course, be quite a novel thing in Ireland, but I think it is to be hoped that some such system may yet be adopted, and that in the south and west of Ireland it may come in along with flax cultivation. A scarcity of water, though, for steeping the flax is a very serious difficulty, in the north of Ireland, and one which it is not easy to see any escape from.

"In consequence of the small crop of flax this year, many of the scutch mills will not be employed for more than about four months."

SCUTCH MILLS.

Mr. Snape observes with reference to flax scutch mills:—

"I am endeavouring wherever practicable to induce the occupiers of scutch mills to introduce fans for the better ventilation of the mills and also to ameliorate the conditions under which the scutchers work. I

have had several promises made to introduce the fans, and I beg to forward the following taken from the *Belfast News Letter*, December 14th, 1895 :—

“ VENTILATION OF FLAX SCUTCH MILLS.

“ It is always a pleasure to hear of improvements being made in the conditions under which our workpeople have to earn their livelihood, and such improvements are always proof of the progress of any industry. We often hear of the advanced methods of handling and scutching flax on the continent as compared with the way in which it is treated in Ireland. This is undoubtedly a fact and is mainly due to the technical education more readily obtained on the continent, and which is so essential to the success of any industry and especially the textile trade. As a rule, Irish Scutch Mills are scattered in out-of-the-way districts for the purpose of obtaining water power, the employers and the employed having little or no opportunity of obtaining the desired technical education, and the same method of working has been in existence generation after generation, the workmen existing in an atmosphere of dust which to the unaccustomed onlooker would appear impossible. The great improvements effected during the last 12 months in the ventilation of our large flax mills has led H.M. Inspector of Factories to suggest the adoption of a similar method for removing the dust from the scutch mills. Various attempts have been made from time to time to purify the atmosphere of scutch mills, but only in a half-hearted manner. Mr. John H. Stewart of Bog Hill, Coleraine, was the first to realise the advantages and obtain the benefits of the scutch mill free from dust. During working hours he was compelled to run electric light constantly and the light merely looked like a glimmer through the dust. Now that the atmosphere is perfectly free from dust there is no occasion to use the light. Some time ago the Blackman Ventilation Company, Limited, of 31 Bridge Street, Belfast, undertook to effectually remove the dust, the conditions being that if it was not a perfect success they would make no charge. The necessary alterations were complete in a very short time, and the result is as stated. Mr. Stewart kindly offers to allow anyone interested in the trade to see what has been done at his mill, and several of the scutchers in the district are having the same principal applied to their mills, and when this is generally adopted the flax scutcher will be able to say that his occupation is a perfectly healthy one.”

“ PARTICULARS ” CLAUSE.

Mr. T. Birtwistle, H.M. Inspector, who has the superintendence of the administration of the Particulars Clause, Factory and Workshop Act 1891, section 24, and section 40, 1895, reports as follows :—

“ In submitting a brief report for the past year of the working of the 24th section of the Act of 1891, I may say this clause has been better observed than during any previous year of its existence.

“ Previous to February last I had, however, some difficulty with a small section of employers, who contended that the supplying of the various sorts and classes of goods upon a paper posted on a board hung up in the works, was a full and sufficient compliance with the Act, but

after lengthened negotiations, with a view to inducing them to comply without having to resort to prosecutions, an association of employers, to which this small section belonged, passed a resolution requesting all its members to conform, at least for the present, to the Act as interpreted by the Department, since which I have had no trouble on that score. This opposition and the opposition of these same employers some time ago, to the supplying of the particulars in writing, together with a remark that in one case fell from the Bench, viz., 'that a manufacturer had as much right to use private marks as a draper,' did much during the last session of Parliament to assist in securing an amendment, extension, and strengthening of the Act.

"The most unsatisfactory part in the administration of the clause has been the irregularity of the penalties imposed, for while in some cases fairly substantial penalties have been inflicted, in others, for quite as serious offences, they have been let off with costs or with a very nominal penalty. In one case where the employer admitted the offence of supplying particulars 4 to 6 per cent. against the weavers, by which he would retain over 5*l.* per week, which should have been paid to his work people, was let off on payment of costs, and this was by no means a solitary case, but even in this there is one redeeming feature, viz., that those small penalties for the more serious offences are not often imposed by justices connected with or who understand the trade.

"In consequence of the area I have to cover I have perhaps not been able to give that attention to some districts to which they are entitled, notably some parts of Ireland and Scotland and West of England. I have, however, during the past 15 months almost covered Scotland, north of Edinburgh; Ireland has also come in for some share of attention, but have not been able since my appointment to visit the extreme West of England.

"In both Ireland and Scotland I have generally found that the particulars supplied are fairly correct, but in establishments I had not previously visited the particulars supplied were invariably insufficient.

"It is due to the employers that I should say that I have been received by them with the utmost courtesy, and that they have exhibited a most remarkable readiness to conform to my desires in the carrying out the requirements of the Act.

"It is to be hoped that the new Act, with its amended and greatly extended provisions, which comes into operation on the first of January next, will set at rest those knotty points that have frequently been raised under the 24th section of the Act of 1891, and that it may be administered with the smallest possible friction or extra labour to the employers who come under its operation."

In accordance with the request made in the House of Commons during last Session, Miss Anderson, H.M. Inspector of Factories, has prepared a précis of the factory regulations in Germany and Austria, and I would express my indebtedness to her for the great care and trouble she has taken in collecting information and making the necessary translations. We feel deeply indebted to Dr. Neuhaus, Geheimer Regierungsrath, &c., &c., for having a conference with Miss Anderson, during his recent visit to this country to inquire into English factory legislation on behalf of the German Government, and for his valuable assistance.

GERMAN EMPIRE. PROTECTION OF LABOUR IN INDUSTRY.

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(1) Die Reichs-Gewerbe-Ordnung, Illing, and Kautz, Berlin, 1895; (2) Die Reichs-Gewerbe-Ordnung, Drs. Berger and Wilhelmi, 1895; (3) Amtliche Mittheilungen aus den Jahresberichten der Gewerbeaufsichtsbeamten, 1894; (4) *Ibid.*, 1895; (5) Jahresberichte der Kön. Preuss. Regierungs und Gewerbe-Räthe, 1894; (6) *Ibid.*, 1895; (7) *Ibid.*, Bavaria; (8) *Ibid.*, Saxony; (9) *Ibid.*, Württemberg; (10) Report on the Berlin Conference; (11) Royal Commission on Labour, Foreign Reports, vol. v.; (12) Die Unfallverhütungs Vorschriften, R. Platz, 1890; (13) Über Gefahren für die Arbeiter in Chemischen Fabriken, von Dr. K. W. Jurisch, Berlin, 1895; (14) Hygiène et Sécurité des Travailleurs dans les Ateliers Industriels, République Française, Office du Travail, 1895; (15) Bulletin de l'Inspection du Travail, 1895; (16) Soziale Praxis. Centralblatt für Sozial Politik, 1895; (17) Zeitschrift der Centralstelle für Arbeiter Wohlfahrts Einrichtungen, January 1895; (18) Rechnungsergebnisse der Berufsgenossenschaften, Nachweisung für das Jahr 1894, von Bötticher; (19) Denkschrift über die Entwicklung "der Gewerblichen Fortbildungsschulen, &c., in Preussen, 1896; (20) Vierteljahrshefte zur Statistik des Deutschen Reichs, 1895.

1.—*General Scope of the Laws.*

The factory laws in the German Empire do not remain as in England, or in France, a separate group of enactments, distinct, for example, from provisions against truck or control of markets, or regulation of contract between employers and employed in industry. It is in certain chapters of the Industrial Code of the Empire, last and most materially amended in 1891, which applies as a whole to all trades and industrial occupations, with exception generally of railways, maritime transport, fisheries, and partly of mines and agriculture (see section 86 R.G.O.),* that the basis of the regulations corresponding to our Factory and Workshop Acts must be sought.

The general scope of the code is a very wide one, including, in addition to the points just mentioned, such matters as control of pedlars, formation of guilds and workmen's committees, conditions of licenses to public houses; and the subjects are so interwoven that it is impossible to print certain chapters as *alone* treating of protection of labour in the sense of the English Factory Acts.

It is impossible within the present limits to touch on the history of the code, showing incidentally how, even before their inclusion in the

* Abbreviations used in this précis:—R.G.O.=Reichs Gewerbe Ordnung=Industrial Code of the Empire; U.V.G.=Unfallversicherungs Gesetz=Accident Insurance Law; R.G.=Reichsgericht=Supreme Judicial Court.

code, a general similarity between the laws of many of the separate States might be recognised, but it is important here also to simply draw attention to the distinction still remaining between procedure based on earlier legislation of the States and that based on subsequent Imperial legislation, a distinction which appears more prominently when the question of administration arises. While, for example, the criminal, the commercial, and the industrial laws have been codified for the Empire, much of the States legislation remains, and the scheme for the codification of the civil law is still under consideration.

"The civil law . . . as it has been handed down by the "territorial governments still remains side by side with the Imperial "constitution" and affords a "fruitful source of confusion to the uninitiated."*

As will appear, further, the Industrial Code gives power still to the separate States to initiate certain exceptions which may form part of the law regulating factories in any given State.

Although no historical sketch can be here attempted, it seems proper to draw particular attention to the comparatively recent development of some of the all-important points in protective legislation, e.g., those specially limiting periods for women's labour. So great were the changes inaugurated by the amending law (*Gewerbe novelle*) of 1891 that Germans are apt to speak of that date almost as if it were the beginning of factory regulation. No true estimate of the present development can be formed if consideration of this fact is neglected.

Returning to the scope of the Industrial Code, one of the first points to be observed is that it is here that the local sanitary authorities find, to a very considerable extent, the basis of their action in the matters of industrial hygiene which bear on public health. In particular, certain undertakings are enumerated (e.g., *infra*, p. 156) as unhealthy or dangerous "whether to their owners, possessors of adjoining property, or "the general public," and are subject to special authorisation which is dependent on fulfilment of specified conditions of health and safety. These varieties of undertakings number between 40 and 50, and include, e.g., chemical and gas works, foundries, starch factories, wool-sorting works, cellulose factories, and lead-enamelling works. The conditions of authorisation may and often do include conditions for protection of workers employed, and the list of undertakings may be added to or altered by concurrence of the Federal Council of the Empire and the *Reichstag* (R.G.O., Sections 16 to 28). As indicated, conditions of contract between employers and adult workers are regulated by the Code, which makes minute provision for notice to terminate agreements and for workers' certificates, but in case of men, hours of labour, and other conditions, not directly turning on questions of health, safety, and morality, are left to individual agreement. In exceptionally dangerous or unhealthy occupations the Federal Council of the Empire, or the Central State authorities, or police authorities, may require special conditions of employment of adult workmen, and duration of work, with regulations as to times for beginning and ending, and specified rests may be determined by order of the Federal Council (Section 120e, R.G.O.). Sunday labour is also prohibited for all classes of workers, although exceptions to the rule are provided for in a large number of cases by a subsequent decree (February 5, 1895). With these exceptions, employers may not require their workers, men or women, to work on Sundays, or on local holidays and religious festivals, the number being determined by the Central

* Royal Commission on Labour. Foreign Reports, Vol. v., p. 9.

Government in each State (Sections 105a to 105h, R.G.O.). In all cases the employer is bound to take measures to secure the safety and moral and physical welfare of all classes of industrial workers (Sections 120a to 120b, R.G.O.). The distinction between "industrial workers" in general, and "factory workers" in particular, is an all important one, as it is under the latter heading that the general restrictions of hours and times of labour for women and children alone apply. The former term includes, broadly, every worker in large or small industries, not expressly excluded from the scope of the Code. To all these the regulations above outlined apply, so that even in a small workshop there is room for extensive State interference and regulation on grounds of health, morality, and safety. It is remarkable, in view of the importance of the regulations standing under the heading "factory workers," that this term is not defined by the Code. This is illustrated by various decisions of the Supreme Imperial Court (*Reichsgericht*), which lay stress now on one feature, now on another, distinctive marks being size of the building, numbers employed, sub-division of labour, and position of the employer. On October 16th, 1886, it was held that a ladies' ready-made clothing business (*Damen Confektions Geschäft*), carried on without power, was to be regarded as a factory, the decision resting partly on a consideration "whether those risks were present for youthful workers which it was "the purpose of the Legislation to guard against."* It may be pointed out that both in 1878 and in 1891 a definition was prepared in the drafts of amendments by committees of the *Reichstag* of the term "factory," and in both cases it was expressly left undetermined. According to Section 154, however, certain definite classes of undertakings are to be held as included under the notion, viz., "forges, timber and other "building yards, dockyards, and such brickfields and open quarries as "are not of a purely temporary character." The "bearing of the latter "qualification is decided in all doubtful cases by the higher administrative authorities." The main sections restricting hours, &c., in "factories" apply "to all employers and workers in workplaces "(*Werkstätten*) in which processes are carried on, more than "temporarily, by power (steam, wind, water, gas, electricity, &c.), with "the exception of any special kind of undertaking which may be "expressly exempted by the Federal Council."

"Other workplaces may be wholly or partly brought under the same "regulations by Imperial Decree with consent of the Federal Council," and it is to be understood that some extensions of the law under this clause will be effected before long. The only workplaces expressly excluded are those in which the employer has no one working but members of his own family (Section 154).†

The same regulations (Sections 135 to 139b), as well as the provisions against truck, are moreover "expressly applied to mines (*Bergwerken*), "salt works, ore-preparing works, and underground quarries." "Work- "women may not be employed underground in these works" under pain of the highest penalties (2,000 marks, or six months' imprisonment) provided by the Code.

In all "factories" every species of worker concerned in carrying out the purposes of the manufacture, including apprentices or learners in any branch of the work, packers, warehousemen, and drivers, are included in

* Zeitschrift der Centralstelle für Arbeiter Wohlfahrts Einrichtungen, January 1895. Berger and Wilhelmi, R.G.O.

† For a full treatment of the various decisions and considerations affecting the extension of the term factory, see the Zeitschrift der Centralstelle für Arbeiter Wohlfahrts Einrichtungen," 1895 January 1, p. 60.

the conception, "factory worker" (decisions of the *Reichsgericht*, June 20, 1884; January 5, 1886; May 19, 1893, &c.) Some of the difficulties arising from the indefinite use of the term *factory* may be seen in the following cases:—

In 1893-94 it was reported by an inspector that "the provisions " limiting the hours of adult women have been disregarded in several " clothing workplaces (Magdeburg), because both the police authorities " and the employers held that the places could not be regarded as " factories in the sense of the Industrial Code. The matter has been " taken up, but the proceedings are not yet completed." In the report for 1894-95, it appears that subsequently the inspector was enabled to enforce observation of the law through a decision in favour of his view by the *Regierungspräsident*.* Against this case have to be set contrary decisions, of which the following are typical:—

" The decrease in numbers of permits as to overtime (in Hamburg) rests on the fact that few clothing workplaces can now be treated as factories. Since the decision of a court that a mantle-making establishment employing 140 workers was not a factory, and the publication of this decision in the trade journal, 'Ready-made Clothing,' our control of the large clothing businesses has become most difficult."†

Two managers of a mantle and overcoat business in Minden, with nearly 56 workers in all, were convicted in a 10-mark fine by the Sheriffs' Court (*vom Schöffengerichte*) for infringement of Section 137, R.G.O. because they had employed their workers after 5.30 p.m. on Saturday. The Penal Court (*Strafkammer*) reversed this decision on appeal on the grounds that the characteristics of a factory were wanting in that the work was carried out on individual order and measurement.‡

It would appear from the reports of inspectors§ that laundries are included without question under the meanings, respectively, of the terms "industrial establishments" and "factories." Differences of opinion apparently exist among authorities as to whether dairies and cheese factories are to be considered as belonging to agriculture, or as included under the Industrial Code. In all "factories," and the establishments expressly included under this term, where more than twenty workers are employed, the employer is bound to affix a legible copy of the working rules of the establishment, and of this a copy must be supplied to each worker entering the employment.

The rules are to be in conformity with the provisions of the Code, and must indicate, among other matters, periods of employment and pauses, method of paying wages, length of notice to terminate contract, disciplinary regulations, &c. A copy must be sent to the local authorities, who have the duty of calling in question any illegality that may be found in them, and, in case of dispute, there is an appeal to the higher administrative authorities. No rule is then binding on the workers, unless contained in the working rules and in conformity with the Code; opportunity is to be afforded the workers of full age to express an opinion on the rules, and wherever workmen's committees have been formed in a factory, in accordance with Section 134*h*, they have a claim to conference with the employer on this subject (R.G.O., Sections 134*a* to 134*h*). This important institution of workmen's committees will receive fuller treatment presently (*infra* p. 180-2).

* Amtliche Mitteilungen aus den Jahresberichten der Gewerbeaufsichtsbeamten, 1893, p. 144; 1894, p. 57.

† *Ibid.*, 1894, p. 59.

‡ *Ibid.*, 1893, p. 144.

§ *Gewerbeaufsichtsbeamten*. This includes industrial councillors as well as inspectors, but the more familiar English term is here used as an equivalent.

The special provisions which limit employment of women, young persons, and children have effect only in "factories," as above defined, and will be dealt with separately (R.G.O., Sections 134 to 139*b* and 154).

Notice of intended employment of these protected persons is to be sent to the local police authorities in prescribed form, and a copy is to be forwarded by the latter to the government inspector; the local authority is also bound to see that prescribed registers of protected persons are kept in the factories.

The Federal Council is empowered to forbid employment of women, young persons, and children, or to exact certain conditions of their employment, in occupations where there are special dangers for health, safety, or morality (R.G.O., Section 139*a*). A considerable number of such administrative orders (*Ausführungsbestimmungen*) have applied the powers given in the article just cited, and in article 120*e* relating to workers in general, for extended control of safety and sanitation in particular industries. Most of them bear dates between 1892 and 1895, although some of these are merely amendments of earlier regulations (*see infra*, pp. 156-7 and *ff.*)

No adequate conception of the scope of State control of factories in Germany can be given without reference to the institution of compulsory insurance against accidents, which has so profoundly modified the public view of responsibility for injury through industrial accidents, and compensation for the same, by substituting the notion of trade risk for personal risk. Since 1884, employers, compulsorily organised in trade groups, either confined to a particular district or extending throughout the Empire, are collectively liable for all injuries befalling workmen during employment, which are not deliberately self-inflicted. With this exception, the injured workmen, or their representatives in case of death, have a claim to compensation from the competent trade association of the employers. The sums due to them are paid monthly through the post offices, and the associations are bound to repay the latter at the end of five months. If it appears in Court that an employer or his representative have caused the accident through gross carelessness, or intentionally, the association must be reimbursed for the indemnity by the employer.

The trade associations (*Berufsgenossenschaften*) have civil personality and are empowered to draw up rules for prevention of accidents in the industrial establishments concerned, binding on all members under penalty of fines, and to appoint trustees (*Vertrauens Männer*) to see that all due precautions for security of life and limb are observed.

Indemnities are granted where an injury disables for longer than 13 weeks (shorter periods being provided for by the sick insurance funds to which workers are compelled to contribute), or in case of death, after special inquiry by local police authorities (U.V.G., Sections 53 and 54). Arbitration Courts, composed of representatives of the association and delegates elected by workers, adjudicate on all disputes between a worker and an association as to amounts of an indemnity (Sections 46 to 49 and 52). Appeal may be made from the decisions of these Courts to the Imperial Insurance Office, the supreme tribunal in these matters (Section 13).

Rules laid down for prevention of accidents are best considered in connection with general provisions for fencing machinery and regulation of dangerous trades (*infra*, p. 152 and 167). All workers are insured whose wages do not exceed 2,000 marks a year, employed in any of the establishments included by the Accident Insurance Law. "The obligation " holds good even where the employment is merely temporal and unpaid.

" The comprehensive scope of the law becomes apparent when it is seen that the only classes of wage-earners not entitled to its benefits are fishermen, artizans,* domestic servants, messengers, and travelling merchants. All industries employing . . . power are included, as well as mining, working in metals, working in stone, well-digging, transport, loading, and packing of goods, and subsidiary industries of every kind. . . . The obligation may be extended by local statute to foremen or factory officials earning more than 2,000 marks."†

2.—*System of Administration and Organisation of the Inspectorate.*

The general supervision of the execution of the Industrial Code with administrative orders and supplementary regulations, Imperial, Federal, and Ministerial, is entrusted to the authorities in each Federal State. Formerly the States might be left free by the Federal Council to decide whether the factories should be regulated simply by the ordinary police or local administrative authorities, or by special officials in addition to these; but, since 1891, they have been bound to appoint industrial councillors and inspectors (*Gewerbeaufsichtsbeamten*), who are now generally entrusted with the supervision of the regulations affecting both "industrial workers" and "factory workers."‡ These government inspectors have, therefore, to supervise small as well as large industries, including, under some provision or another, practically all factories and workshops, except such as are purely domestic in character.

The provisions with which they are specially concerned by direction of the Industrial Code are those relating to: (1) Cessation of work on Sundays and holidays; (2) Safety, sanitation, and morality in all classes of industrial establishments; (3) Affixing of working rules and formation of workmen's committees in factories; (4) Limitation of hours and other special conditions of employment of protected persons in factories.

" In the exercise of their control these officials are invested with the same powers as the local police authorities, in particular with the right of inspection of the places under their care at any moment whatsoever.

* * * *

" The relations between these functionaries and the ordinary police authorities are regulated in each State by its respective constitution.

" Further, these officials must report annually on their work. Their reports, or extracts from them, are to be laid before the Federal Council and Imperial Parliament.

* * * *

" Employers are bound to prepare such statistical statements for the inspectors or police authorities respecting their workers as may be required by the Federal Council or the State authorities" (R.G.O., Section 139b).

As to any further development or sub-division of the work of the inspectorate the Industrial Code is silent, and, as may easily be seen, room has been left for considerable divergence in the principles of organisation and the actual duties laid upon the separate staffs.

The circular instructions issued in the form of a decree (*Allerhöchster Erlass*) for Prussia in 1891, which has to an important extent served as a model in the other States, shows some striking modifications of, and

* A term including those working in workshops where less than 10 persons are "regularly employed," see U.V.G., Section 1.

† Royal Commission on Labour, Foreign Reports, vol. v., p. 76.

‡ Berger and Wilhelmi, *Gewerbeordnung*, &c., 1895, p. 250.

additions to, the duties laid down in the section just cited.* The inspectors are now further charged with : (1) Surveying with a view to authorisation of buildings in which it is proposed to carry on one of the dangerous trades (explosives, chemicals, &c.,) enumerated in Section 16, R.G.O.; (2) Supervision of the provision for labour books and certificates (Sections 107-113); (3) Enforcement of the provisions against truck (Sections 115 to 119a); (4) Official testing of steam boilers prescribed by the Decree of August 5th 1890.† Moreover, the inspectors are bound to give every assistance in the way of advice, arranging for conferences, and the like, on technical subjects with the various local authorities, and, personally, to further and complete the work of the trustees under the accident insurance laws (*cf. infra*, p. 152) in the matter of provision for security in workshops and factories. The most important modifications are perhaps those relating to prosecutions. The decree expressly forbids the inspectors to make use of the power permitted by the Code, where consistent with the constitution of a State, to institute legal proceedings against employers infringing the Code, and confines them to the rôle of counselling the employers and notifying infringements to the police, through whose action the sanctions of the law are brought into operation. All the rights of the police, which go rather far in Germany, can be brought to bear in administering the Industrial Code as well as the special sanctions provided by the code (*cf. infra*, p. 184). Appeal can be made by the inspectors on account of negligence by police authorities to the provincial authorities (*Landesregierung*), or the State authority (*Staats-anwaltschaft*). The inspector for Mecklenburg-Strelitz cites cases shewing that such appeals may lead to good results.‡

The inspectors are also expressly urged to make as little use as possible of the power given by Section 120d to order immediate alterations in factories, and to reserve this power for the cases where serious danger may arise through delay. They are generally urged in the circular to control the work of the police authorities in such a manner as to secure an even and complete enforcement of the law in the interests of the workers and the public, without "laying needless burdens or vexatious restrictions on the employers," and it is apparently held as a principle that they will be able to effect this largely by persuasive measures, "supported as they are by their intimate acquaintance with "the law in its various bearings, by their technical knowledge, and "official experience."§ The remarkable difference, thus apparent, between the English and the German view of the duties of factory inspectors and the powers necessary to enable them to fulfil their duties, will receive further illustration in considering the application of the particular provisions of the law. It is necessary here to lay stress on the prominence of the place held by the local police authorities in the administration of the code, which it is difficult for us to realise in England, and to point out that while these authorities have power to enforce the law and to exact fines, the employers may appeal from their decisions either to the higher administrative authorities (in Prussia the *Regierungspräsident*), or to the ordinary judicial courts. Full instructions are given for the guidance of the police authorities in the circulars issued on the application of the law. They are to visit every industrial

* Illing-Kautz, *Reichsgewerbeordnung*, 1895, pp. 160 and *ff.*

† *Ibid.*, pp. 186 and *ff.*

‡ Amtliche Mittheilungen aus den Jahresberichten der Gewerbeaufsichtsbeamten, 1893, p. 26.

§ Illing-Kautz, cited, p. 161.

establishment in which the labour of women and children is under restriction, at least once in six months (circular of February 26, 1892, G. II.)* and then must observe and make note of numbers employed and their ages; whether working rules and registers correspond with copies delivered to them; whether periods and meal-times correspond with those named in the notices: and whether other forms and regulations are duly complied with. Employment of protected persons, as already seen, is only legalised after due notice has been sent to the local authorities. They have full powers with regard to all matters concerning safety, sanitation, and morality, provided for in Sections 120a and 120e. Other important matters which the local police authorities must organise, check, or control are: The issue of labour-books; exceptions as to Sunday, and (within certain limits) overtime labour and the approving of working-rules. They are bound "in the execution of "their official duties to communicate regularly with the inspectors " (Gewerbeaufsichtsbeamten)† and particularly : (1) To forward copies " of notices received; (2) To afford them every assistance in the " inspection of the industrial establishments; (3) To undertake revision " of the same at the request of the inspectors, and forward them the " results of revisions; (4) To give the fullest account of all orders " made by them with respect to provisions for safety, sanitation, and " morality in individual factories, as also of the results of all legal " proceedings instituted by them against employers."‡

No documents which pass to the inspectors through the police authorities are more important than those relating to accidents. The accident insurance law provides that all accidents causing death or an injury to a worker which disables for more than three days shall be reported to local police authorities within two days. The latter must forward the notice to the inspectors within three days of receipt and further assist the inspector in every inquiry he sees fit to institute. Other officials with whom the inspectors must keep in touch and from whom they may expect assistance are the district medical officer (*Kreisphysikus*) and district architect (*Kreisbaumeister*). (It appears to be only in Saxony that regular expert chemical advisers are attached to the service of factory inspection). Resident magistrates may call upon the inspectors and their assistants to consult with district or municipal councils in matters relating to authorisation of dangerous trades or construction of steam boilers.

In Prussia no part of the inspector's duties is more onerous than that relating to supervision of steam boilers, and it may be gathered from the reports that the apparently enormous number of officials is not yet sufficient to counterbalance the preliminary difficulties they work under through the recent fusion, presumably on grounds of economy and simplicity of control, of the separate services of boiler and factory inspection.§

The general division of the Empire into districts of inspection will be gathered from a table subjoined. Each important district in Prussia, and in several of the other States, has an industrial councillor, working together with district and assistant inspectors. The isolation of the separate States may be seen not only in the entire absence of any Central Imperial inspector, but also in the fact that a certain number of the

* Illing-Kautz, cited, pp. 128 and *ff.*

† The term includes industrial councillors; for convenience the familiar English term is applied.

‡ Illing-Kautz, cited, p. 162.

§ Amtliche Mittheilungen, &c., 1895, pp. 23-25.

States do not as yet publish their inspectors' reports. Extracts in these cases may be consulted in the official summary for the Empire, but complaints have been made in the labour press and by representatives of the Socialist movement that no general opportunity is afforded to the public for comparing and testing the results of the work in detail. The general system of reports, so far as accessible, appears to an English observer to be of a remarkably extensive and many-sided character (and in one case particularly, viz., Bavaria, the method and style of editing is excellent), while nothing is more striking in the separate reports than the understanding and sympathetic power of observation brought to bear on their work by many of the officials. Certain great qualities in their work are no doubt gained by their detachment and two-fold character as counsellors, both of employers and employed on the one hand, and critics of the administration of the Code by local authorities on the other. At the same time the results of their activity as presented in their reports, and particularly in the statistics which show so clearly the proportion of infringements of the Code to convictions secured (*cf. infra*, pp. 177 and 186), give considerable support to the view of the duties and proper powers of inspectors of industry, laid down so ably by M. Bouquet, of the Higher Commission of Labour in France, before the Milan Congress of 1894. That view sees in the root-idea of the English system of inspection—namely, direct, practical enforcement by the government official, possessing adequate executive powers, of respect for the general and special provisions of the law—the true basis of a successful control of the conditions of labour in industry. Admirable as are the opportunities open to the Government inspector to gather and systematise information upon the economic conditions of the lives of workers, and their general relations with employers, it must be remembered, as M. Bouquet says, that "the primary and essential part of their function" is to ensure observation of the laws protecting labour, and that no function should be added or limitation imposed which in any way tends to overweight or weaken the first.*

An official expression of dissatisfaction with existing limitations to enforcement of the Industrial Code, through defects in police control of its sanctions, may be seen in the introductory summary to the Bavarian inspector's reports. With regard to the overweighting of the Prussian staff with supervision of boilers, the views of several inspectors might be quoted, but the following (from Posen) appears most conclusive:—
 "The want of confidence of the workers towards . . . the
 "inspectors . . . is the natural result of their infrequent visits
 ". . . The officials are almost entirely absorbed in boiler inspection
 "and . . . come, in consequence, far more in contact with employers
 "than workers."† The comments of M. Vandevelde on the introduction of a somewhat similar overburthening of the system of inspection in Belgium appear not inapposite:—"The primary fault of this organisation is that the greater number of the factory inspectors are overwhelmed with work, and must possess technical knowledge of a kind quite different from that which one should look for in them. One can indeed be an excellent engineer, and possess the most supple spine suited for creeping into boilers, and so discovering their defects; one can possess all chemical knowledge . . . and yet fall short of understanding the needs of the workers and the regulations required on their behalf."‡

* See *Bulletin de l'Inspection du Travail*, 1895, No. 2, p. 109.

† *Jahresberichte der Kön. Preuss. Gewerberäthe*, 1895, p. 124.

‡ *Soziale Praxis*, December 5, 1895, p. 270.

The desire for women as factory inspectors, and the present development of the movement for their appointment in Germany is more conveniently treated in connection with certain special points of the law (*infra*, pp. 150-1).

States.	No. of Industrial Councillors and Inspectors.	No. of Assistants.	Establishments in 1894.	Workers in these Establishments.	Sub-division of Districts.
Kingdom of Prussia. (Pop. 29,960,000).	27 Industrial Councillors. 90 Inspectors.	58	34,345	1,284,652	1. E. Prussia. 2. W. Prussia. 3. Potsdam. 4. Frankfort-on-the-Oder. 5. Berlin and Charlottenberg. 6. Pomerania. 7. Posen. 8. Breslau. 9. Liegnitz. 10. Oppeln. 11. Magdeburg. 12. Merseburg. 13. Erfurt. 14. Schleswig. 15. Hanover. 16. Hildesheim. 17. Muuster. 18. Minden. 19. Arnsberg. 20. Cassel. 21. Wiesbaden. 22. Coblenz. 23. Düsseldorf. 24. Cologne. 25. Trèves. 26. Aix la Chapelle. 27. Sigmaringen.
Kingdom of Bavaria. (Pop. 5,595,000).	8 Inspectors -	1	6,485	160,644	28. Upper Bavaria. 29. Lower Bavaria. 30. Pfalz. 31. Regensburg. 32. Upper Franconia. 33. Middle Franconia. 34. Lower Franconia and Aschaffenberg. 35. Swabia and Neuburg.
Kingdom of Saxony. (Pop. 3,503,000).	3 Industrial Councillors. 10 Inspectors. 2 Government Architects. 12 Expert Chemists	12	13,411	382,569	36. Dresden. 37. Chemnitz. 38. Zwickau. 39. Leipzig. 40. Bautzen. 41. Meissen. 42. Plauen. 43. Freiberg. 44. Annaberg. 45. Aue. 46. Wurzen. 47. Döbeln. 48. Zittau.
Kingdom of Württemberg. (Pop. 2,037,000).	3 Inspectors -	3	2,378	97,765	49. Stuttgart. 50. Neckar district. 51. Black Forest.
Grand Duchy of Baden. (Pop. 1,658,000).	1 Councillor 2 Inspectors	-	1,107	87,086	52. Baden.
Grand Duchy of Hesse. (Pop. 993,000).	2 Inspectors -	2	700	34,347	53. Province of Starkenburg. 54. Rhenish Hesse.
Grand Duchy of Mecklenburg-Schwerin. (Pop. 579,000).	1 Inspector 1 Surveyor	-	221	8,113	55. Mecklenburg-Schwerin.
Grand Duchy of Saxe-Weimar. (Pop. 326,000).	1 Inspector -	-	271	13,891	56. Saxe-Weimar.

States.	No. of Industrial Councillors and Inspectors.	No. of Assistants.	Establishments visited in 1894.	Workers in these Establishments.	Sub-division of Districts.
Grand Duchy of Mecklenburg-Schwerin. (Pop. 98,000.)	<i>See Mecklenburg-Schwerin.</i>	—	66	1,434	57. Mecklenburg-Strelitz.
Grand Duchy of Oldenburg. (Pop. 355,000.)	1 Councillor -	—	244	8,095	58. Oldenburg.
Duchy of Brunswick. (Pop. 405,000.)	1 Councillor -	1	311	18,353	59. Brunswick.
Duchy of Saxe-Meiningen. (Pop. 225,000.)	1 Councillor -	—	290	—	60. Saxe-Meiningen.
Duchy of Saxe-Altenburg. (Pop. 171,000.)	1 Inspector -	—	809	13,198	61. Saxe-Altenburg.
Duchy of Saxe-Coburg and Gotha. (Pop. 207,000.)	- - -	—	243	9,981	62. Saxe-Coburg and Gotha.
Duchy of Anhalt (Pop. 272,000.)	1 Councillor -	—	411	18,891	63. Anhalt.
Principality of Schwarzburg-Sondershausen. (Pop. 76,000.)	1 Inspector -	—	100	3,870	64. Schwarzburg-Sondershausen.
Principality of Schwarzburg-Rudolstadt. (Pop. 88,000.)	1 Councillor -	—	135	5,493	65. Schwarzburg-Rudolstadt.
Principality of Waldeck and Pyrmont. (Pop. 57,000.)	- - -	—	—	—	66. Waldeck and Pyrmont.
Principality of Reuss (older branch). (Pop. 63,000.)	1 Inspector-General of Constructions.	—	210	12,092	67. Reuss.
Principality of Reuss (younger branch). (Pop. 120,000.)	1 Inspector -	—	273	15,346	68. Reuss.
Principality of Schaumburg-Lippe. (Pop. 39,000.)	- - -	—	—	—	69. Schaumburg-Lippe.
Principality of Lippe-Detmold. (Pop. 130,000.)	Supervised by the Industrial Councillor for Minden.	—	—	—	70. Lippe-Detmold.
Free town of Lübeck. (Pop. 76,000.)	1 Inspector -	—	180	3,231	71. Lübeck.
Free town of Bremen. (Pop. 180,000.)	1 Inspector -	2	292	10,857	72. Bremen.
Free town of Hamburg. (Pop. 623,000.)	3 Inspectors -	2	1,110	31,015	73. Hamburg.
Alsace-Lorraine (Pop. 1,604,000.)	1 Councillor 2 Inspectors.	—	1,379	72,085	74. Lower Alsace. 75. Upper Alsace. 76. Lorraine.

3. Sanitation and Morality.

By Sections 120a and 120b R.G.O. industrial employers are bound—

- (a.) To arrange and maintain workrooms and machinery, and to organise labour in such a manner as to secure workers against injury to health "so far as the nature of the work will permit."
- (b.) To make such arrangements in the work as will ensure maintenance of good conduct and propriety of manners (*der guten Sitten und des Anstandes*) amongst workers.

In particular, sufficient light must be provided, and rooms be so ventilated, as to carry off dust, vapours, and other impurities arising during processes of manufacture; the sexes shall be as far as possible separated in their work when it is of such a nature as to render this desirable, and separate dressing rooms be provided wherever change of clothes during work is necessary; sanitary conveniences must be provided with due regard to number and sex and workers, and be so arranged as to give no offence to propriety and modesty.

Suitable dining rooms, to be heated during cold weather, may be ordered, wherever it seems desirable, by the police authorities (Section 120d). Special care must be taken by employers to effect suitable arrangements in all matters affecting the health and conduct of young persons employed under 18 years (Section 120c).

Through the order issued in October 1894 by the *Regierungs-präsident* at Potsdam a remarkable means of controlling the execution of the above provisions has been put in the hands of the Prussian industrial councillors and inspectors. It is now made compulsory for the police authorities to forward to these officials notification and plans of all industrial workplaces about to be built or altered, and their approval of the arrangements is to be obtained in every case, just as has hitherto been necessary for the dangerous occupations enumerated in Section 16. "Although this involves a notable increase of work" the officials are "agreed, without exception, that an important advance has hereby been made towards securing safe and healthy workplaces." "The control is made effective in matters of lighting, ventilating, and cubic capacity of the rooms, taking into consideration both the number of workers and the amount and nature of machinery, also in arrangements for dressing rooms, lavatories, and sanitary conveniences. The increase of work is amply repaid by the good results already to be seen . . . , but will be far better appreciated after some years, when the old workplaces are being gradually replaced, and the direct consequences in simplified inspection become apparent." "The undeniable gain arising from a preliminary examination by an expert in industrial technicalities (*eine gewerbe-technische Vorprüfung*) is recognised not only by the competent authorities but also by the employers."*

Thus it is secured that an industry is not carried on in a wholly unsuitable building not originally intended for such a purpose.

The generally vexed question of ventilation occupies the attention of many inspectors. While reports come from every side of the opposition of workwomen to introduction of cold currents of air in warm, badly aired, workrooms, on the other hand many complaints of workers as to

* Amtliche Mitteilungen aus den Jahresberichten der Gewerbeaufsichtsbeamten, 1895, pp. 43-4.

defective ventilation are referred to. The difficulties experienced in improving matters are familiar in every country, and need not here be elaborated. Special attempts to meet the difficulties are interesting. For example, the inspector for Münster reports that one cotton mill in particular fitted with mechanical ventilators served as a useful model for many others. "The inlets for fresh air are fitted with porous brickwork "on to which a spray of water falls . . . In winter this water is heated to a temperature of 40° (Centigrade?). The fresh air streaming "in is maintained in a satisfactorily moist condition. The statistics as to "sickness in this factory are said to show a most remarkable diminution "of the numbers of sick persons, and days of sick leave."* While in many establishments the bad air is drawn off by mechanical ventilators, in the spinning mills of Messrs. Laurenz in Ochtrup an opposite system has been adopted. "The air is drawn in summer from outside, in winter "through the warm engine room, by means of a powerful propeller into "the spinning rooms." The air is dispersed through pipes covered with tow, into which a certain amount of warmth and moisture can be introduced. The pipes are carried along the sloping roofs of the sheds. "For the fine spinning, moisture at from 60° to 65° (Centigrade), and in "the looming rooms at from 50° to 55° is used, and in consequence there "is a constant change of air, and in summer an equally cool temperature "is maintained. Dust is pressed down towards the floor by this "method." The firm reports a decided improvement in the vigour of the workers and an increase of 3 per cent. in the out-put. The installation of the apparatus cost about 6000 marks (about 300*l.*) for an area of 7,500 qm.; in a new building the cost would be less.†

Vigorous measures are being adopted in many cases for dealing with noxious dusts and vapours, but these matters are more properly treated of under the special headings of dangerous or unhealthy occupations (*cf. infra*, pp. 156 & ff.).

With regard to temperature of the rooms improvements have been introduced, especially in sugar factories, in the way of reducing high temperatures by such methods of ventilation as have just been indicated, together with isolation, by all means available, of the sources of extreme heat, such as pipes and furnaces. With regard to the opposite extreme of cold the following from Lorraine may be cited: "Visits during cold "weather show that many abuses in regard to methods of heating remain "to be remedied. In a tobacco factory, for example, 15 workwomen "were found in a large attic warmed only by a small iron stove. On "cold days these women could hardly work for they had continually "to be warming their numbed fingers at their small stove. In small work- "places the means of warming are mostly very defective. In a large "number of shed-like workrooms the means of heating were entirely "wanting. Adequate provisions will for the future be exacted in "the certificate of authorisation, or in the permission to build (*Bauer- "laubniss*).‡ Attention has been given by several inspectors to condition of floors in dyeing houses, laundries, dairies, and other work places. In the Meissen districts, for example, during 1894-5, 24 cases of defective floors were reported; some broken, some damp, others extremely dirty. In the third Würtemberg district it was ordered that the stone floor of an important dye works should be provided with a latticed wooden covering, "with the result that the frequent affections of the feet of workers have been reduced in number."§

* Amtliche Mittheilungen, &c., 1895, p. 368.

† *Ibid.*, pp. 368-9.

‡ *Ibid.*, p. 374.

§ *Ibid.*, p. 377.

Cleansing of rooms and limewashing of walls and ceilings can be required whenever necessary by the local authorities and inspectors, but there are no distinct clauses laying down regulations for enforcing the same periodically.

The reports show, as might be expected, that only a very moderate progress has been made since 1891 towards enforcement of provisions as to lavatory and dressing-room accommodation for the workers. Excellent examples are cited in individual cases, but on the whole an enormous amount of work remains for inspectors and local authorities in this direction. Shocking conditions as to sanitary conveniences are shown as prevailing in brick and tile works particularly, but in many other branches of industry these matters are only too similar to those which have still to be remedied in many parts of our own Lancashire and Yorkshire. The inspector for Hildesheim writes for the current year (1895) that, while "dressing-rooms were wanting in numerous factories where they were urgently needed . . . , defects as to sanitary conveniences were still more frequent; in many cases separate conveniences for the workwomen were wanting. In all these cases measures were taken to remedy the abuses. . . . " It appears that even in factories newly built or re-organised the provisions of the law in these matters have been neglected." From the third Würtemburg district it is reported that in an important factory, employing numerous workwomen, the doors to the sanitary conveniences were purposely defective in order to facilitate control of the women at work by the overlookers. This is especially here cited because matched by a case in my own experience in Lancashire. A case is quoted from Aue of a factory in which it was found that improper construction of sanitary conveniences within the workrooms had been carried out contrary to the conditions laid down in the permission to build; in such a case the matter can be promptly dealt with by the local authorities. In Munich an order has been made by the magistrate, acting with the Local Building Authority, which makes detailed and most stringent provision for sufficient, suitable, sanitary accommodation for workers of both sexes (separate) in all cases.

It is found by the authorities generally that the provision of dressing-rooms and lavatories under Section 120*b* is an extremely difficult one to enforce in those occupations where it has not been expressly laid down that they are to be provided, and where the employers are disinclined to provide for the comfort of their workpeople. The cases where they are expressly provided for may be seen in the section dealing with unhealthy occupations (*infra*, pp. 158, 160, 162). From Potsdam it is reported that in numerous factories "only a few wash-basins are provided . . . , and several workers have to wash together in water that has already been used. The occupiers of a large spinning mill were compelled to provide washing troughs with a continuous flow of water, and in a sugar refinery the employer was ordered to provide shower baths." In a weaving shed where dust was troublesome separate lavatory and dressing-room accommodation was ordered by the authorities. In the case of a shoddy mill where application was made for authorisation to extend the premises, the opportunity was taken by the authorities to order dressing-rooms, lavatories, and dining-rooms, separate for the sexes.*

The inspectors show considerable pre-occupation with arrangements for the benefit of young workers. The inspector for Potsdam wrote in

* Amtliche Mittheilungen, &c., 1893, pp. 210-14, 380-83.

1894 of the exceedingly bad influences brought to bear on the young persons by older workers, especially towards Berlin, influences which he has sought to counteract by urging employers in some cases to exert a personal control, in others to introduce trustworthy women as overlookers. The inspector for Erfurt writes in 1895: "Where young persons are found working with adults care is taken in inspection to find out whether the arrangement is satisfactory." In consequence of such an inquiry a special order has been issued by the *Regierungs-präsident* forbidding the employment of young girls under 16 together with the men at the tobacco spinning tables.*

The Inspector for Berlin and Charlottenburg, referring in 1895 to various serious cases falling under the clause for promotion of good manners (Section 120b), expresses the wish that workwomen might be as stringently "guarded by law against conscienceless employers and their managers as a ward is against her guardian." It is reported from Lorraine in 1895 that, in consequence of recent decisions of the Courts, it has become recognised that women must be largely employed as overlookers where women are concerned. Considerable advances in this direction are reported from various parts of the Empire. In Leipzig exclusively feminine supervision has been resorted to in certain india-rubber works, artificial flower and corset and quilling factories, in laundries, in celluloid ware works, and in clothing factories. It has also been partially introduced in cardboard and cigar box works, book-binding, and various other factories. In the Zwickau district it has been successfully introduced in several hosiery and other textile factories.

"Women as overlookers have not been introduced yet so freely as is desirable, as may be recognised in the recurrent complaints as to roughness towards workwomen shown by overlookers and foremen. . . . In one case (Baden) where it was generally admitted that a workwoman had been struck for . . . some trifling reason by a foreman, the directors refused to make inquiry into the matter because the woman had not come to them with her complaint. The general methods of organisation in the factory fully justified the workwoman in her belief that such a step would be of little use for her, and the directors were notified by the authorities that, under the prevalent conditions and in view of the refusal to inquire into the case, the complaint was held to have been well-founded." The official extracts do not remark on the subsequent position of this workwoman. She would be protected from immediate dismissal by Section 122 of the Industrial Code.

From Hamburg it is reported that, whereas employers would prefer women as overlookers, in many cases they cannot be introduced through lack of sufficient knowledge and ability to control machinery.

The desire urged by women in Germany for appointment of women as factory inspectors has not yet led to any very practical response on the part of the various State Governments, with the exception perhaps of Baden and Hesse, where schemes appear to have been recently adopted by the legislatures which may admit women to a strictly subordinate position in the inspectorate.† Possibly a broader view may prevail to meet both the objections urged against a restricted view and the representations made as to the needs of women as industrial workers both within and without the Legislatures.‡

* *Jahresberichte der K. Preuss. Gewerberäthe*, 1895, p. 232.

† See *Soziale Praxis*, December 1895 and January 9, 1896.

‡ See especially the arguments reproduced in *Soziale Praxis*, February 27th, 1896, giving a summary of a debate in the lower chamber, Hesse.

It is maintained by a writer in "Soziale Praxis" that the scheme contemplated in Baden will not satisfy the essential point (*Kernpunkt*) of the demand for women inspectors. "If official powers are withheld in any way from the women assistants their authority with the employers is undermined, together with any power to control abuses or verify the complaints of workwomen."

4. Fencing of Machinery and Accidents.

Employers in every kind of workshop and factory, except in the cases excluded from the scope of the Industrial Code, are "bound to arrange and maintain workrooms, mill-gearing, machinery, and implements, and to organise the management in such a way as to protect the workers against dangers to life and health, so far as the nature of the work will permit." In particular, "such fencing is to be provided as will protect the workers from dangerous contact with machinery, or parts of machinery, or other dangers in the nature of the workplace, or the work; and, especially, provision is to be made for safety in case of fire. Finally, rules are to be laid down for the management of the work and organisation of the workers, which are necessary for safety in dangerous occupations" (Section 120a, R.G.O.).

The competent police authorities are authorised to lay down regulations for individual factories which may be necessary to carry into effect the above section. Wherever these regulations are not devised to meet a pressing danger to life or health an appropriate period for carrying them into effect must be allowed for. The employer may appeal within two weeks against the decision of the police authorities to the "higher administrative authority," and against the decision of the latter, appeal may be similarly made to the central State authority, whose decision is final. If the decision conflicts with the "rules laid down by the competent Accident Insurance Association" (*Berufsgenossenschaft*),* a copy of the order of the Court must be sent to the directors of the Association within the period of delay allowed to the employer for carrying it into effect." (Section 120d.).

By order of the Federal Council, special rules for safety in branches of industry may be laid down, and "so far as such rules have not been decreed by the Federal Council they may be provided for by the central State authorities (*Landescentral Behörden*), or by means of police regulations promulgated by the competent authorities. Before promulgation of such orders . . . opportunity is to be given to the directors of the trade association concerned to offer an opinion upon the matter."

It must be recollected that while these opportunities are thus given to the trade associations, created by the Accident Insurance Law, to co-operate with the State factory departments, the administration of the provisions for security remains, theoretically at least, entirely untrammelled by the existence of another set of officials; where any difference of opinion arose, the views of a trustee under the accident

* See above, p. 140.

insurance law could not be upheld against those of a Government inspector in matters of fencing or prevention of danger to life or limb.

That the trustees of the trade associations, representing the employers, should desire to see another interpretation prevail is perhaps only natural, and evidence of this desire may be incidentally seen in a discussion which arose at a congress of these trustees in September last at Eisenach. A suggestion was made and sustained (although not embodied in the form of a resolution), that the supervision of provision against accidents (*Unfallverhütung*) should be withdrawn from the inspectors and entirely given over into the hands of the trustees of the associations.* In the meantime the following provision subordinates the trustees to the government inspectors: "The directors of the trade associations shall forward the names and addresses of their trustees to the higher administrative authorities of their districts. "The trustees are bound, when so required by the Government inspectors, to forward regular reports of their visits to factories, "showing results, and can be condemned in default by the Imperial insurance office to a fine not exceeding 100 marks" (Section 85, U.V.G.). It is surprising in view of the far greater importance of the control exercised by the Government inspectors for security of life and limb, that no provision is made in the Industrial Code that accidents in industrial establishments shall be *directly* reported to them. The accident insurance law provides, as already shown (*supra*, p. 143), that every accident in the establishments concerned which causes the death of any person employed, or results in an incapacity for work, lasting longer than three days, shall be reported to the local police authorities and the latter are required by rescripts of February 23rd, 1886, and May 24th, 1892, to forward copies of the reports to the Government inspectors, who are to receive, further, every assistance they may require in any inquiry they make.

It is in case of accidents resulting in death or inability to continue work within 13 weeks, that question of indemnities arise, and therefore in these cases that the accident insurance law requires a formal police investigation (Section 53, U.V.G.). Representatives of the trade association, the sick insurance fund, and the employer, or his representative, have a right to be present at the investigation. So far as possible an expert (*Sachverständige*) is to be engaged, at the expense of the trade association, to aid in the inquiry. Sometimes the Government inspector for the district acts in this capacity, but as the employers are at liberty to name their expert, they are not always proposed.

General rules for the fencing of engines, gearing, and dangerous machinery, and special rules for particular processes or use of tools, besides instructions as to arrangement of workrooms, staircases, and court-yards, and measures for security against fire, are laid down by a considerable number of trade associations.† Definite instructions are also issued which are more particularly binding on workers. Many of the rules provide excellent practical applications of the principles laid down in Section 120a of the Industrial Code, and perhaps specially mention may be made of the North German, the South German, and other trade associations for "wood industries," which have stringent provisions for fencing and use of circular and other saws, planing machines, and various dangerous machines. Among other matter the

* See *Soziale Praxis*, Centralblatt für Sozialpolitik, November 7, 1895, p. 162.

† Die Unfallverhütungs Vorschriften, R. Platz (Berlin, 1890).

South-west German Iron Trade Association lays down minute regulations for the use of locomotives in factories ; the different hardware and cutlery trade associations provide for safety in use of grindstones, and prescribe use of respirators and protecting spectacles for workers. The Forge and Rolling Mills Association lay down rules for security of workers engaged at or near processes in connection with Bessemer converters ; the Silesian Textile Trades Association lays down that all looms driven at a speed of over 60 picks a minute must be provided with shuttle-guards and the Rhenish-Westphalian Association prescribes the guards for shuttles irrespective of speed.

The Government inspector's report from Baden, however, shows that among several subjects of discussion with the trade associations this very matter of shuttle-guards had given rise to differences of opinion. In the Potsdam district also the Government inspector had to notify the trustee of the trade association that the wooden guards he had passed were inadequate ; eight serious accidents, causing wounds in the hand or loss of an eye, had taken place in the district in the course of the year. This inspector apparently considers that complete safety can only be attained by a combined use of wire guards on the loom and side nets. From West Prussia the Government official writes :—“ If “ many more cases were to arise in which the requirements of the “ inspector are unfavourably commented upon to the employers by the “ trustees . . . the work of the inspector would be rendered “ extremely difficult.” “ The only association (West Prussia) whose “ activity in prevention of accidents was adequate is the Wood “ Industries Association. . . . Better work could be done if the “ Associations directed the efforts of their trustee towards a joint “ action with the Government inspector.” In the Arnsberg district great difficulties have been experienced in a thorough application of the provisions of the code as to safety “ through the very varying “ regulations adopted in quite similar matters ; for instance, for hoists, “ driving bands, &c., by the different trade associations. It is “ urgently desirable that greater unity of regulations in the more “ important safeguards should be attained.”

Although in a remarkable number of instances favourable reports are given as to joint action of the trustees and inspectors, producing most satisfactory results, e.g., in Breslau, Düsseldorf, the Pfalz, and other districts, some such re-organisation as is recommended by the Arnsberg official seems to be pressingly needed. Further the advice given by the Government official for Lorraine is noteworthy. Since the inspector is “ often under the necessity of requiring much more thorough safeguards “ than the trustee (of the employers association) can see his way to “ requiring, he (the inspector) will do well to rely, as far as possible, “ on the general provisions laid down by the association, and “ where these fall short to advise the trustee beforehand of his “ views.” This method has been adopted by the inspector recommending it, with most satisfactory practical results, and improved relations both with individual employers and the trade association concerned. The Baden inspectors have found that direct communication with the board of directors of the trade association affords a more satisfactory means of arriving at joint action in prevention of accidents than any intercourse with individual trustees, who are, it may be noted in passing, frequently themselves employers. These inspectors (Baden) have also found it useless to enforce that section of the accident insurance law,

which requires the trustees to forward reports to inspectors (Section 85).* The alleged defects of this system of organisation by a double set of officials, lead to a comparison with the Austrian system (*infra*, p. 200), which leaves the duty of prescribing measures for security almost entirely in the hands of the inspectors.

No general statistical tables are given in the official summary of inspectors' reports to show numbers of accidents, their causes, and results in factories and workshops. For any general survey, reference should be made to statistics as to indemnities granted, on account of injuries, through the Imperial Insurance Office. The total number of notices of accidents there received in 1894 reached 190,744, or 36·37 per cent. of all persons insured; the total number of indemnities paid were 32,797, or 6·25 of the persons insured.

Most interesting statistics of causes and results of accidents are further given in the report of the imperial insurance office.† Rough estimates of numbers of accidents are gathered by the inspectors through the copies of reports sent to the Police Authorities, and forwarded by them, supplemented by the inspectors' own observations, but in too many cases the copies do not reach them. In a certain number of districts there is an apparent decrease in 1894 in numbers of the more serious accidents, accompanied in a few instances by an increase in number of less serious accidents, a result which appears not improbable under the existing system of accident insurance. In a considerable number of districts the inspectors have received an increased number of reports of accidents; for example, in Frankfort-on-the-Oder, Berlin, and Charlottenburg, Leipzig, Dresden, and others. This increase may be in some cases attributable to increased zeal on the part of police authorities. Grave complaints of irregularity in forwarding, and incompleteness of reports are made by the inspectors in Hildesheim, for the province of Posen, in Cologne, Schleswig, Upper Bavaria, and many other districts. Interesting attempts are made by some of the inspectors to show the percentages of accidents occurring in given industries, or under given trade associations, but the bases of the calculations appear not sufficiently broad to justify a reproduction of their conclusions here. Several of the inspectors find that the majority of accidents occur particularly at the beginning and end of the week. Many accidents are attributed to the cleaning and oiling of machinery in motion and the removing of bands by hand during motion, practices against which the inspectors in general have set their faces. In Swabia and Neuberg action was taken in several cases, after information had been given by the workmen that they were required to clean and oil dangerous machinery in motion. In Hanover the inspector finding that accidents to textile workers arose frequently through cleaning machinery in motion on Saturday afternoon no regular time having been fixed for this work, arranged with the employers to stop the engines an hour before the usual closing time. As most of the workers were paid by piece the consequent fall in their wages has led to discontent and a return to the old practice. It is obvious that no solution can be satisfactory or final which leaves the wage-paid worker to clean machinery either at risk of life and limb, or at his own pecuniary loss, through want of a proper contract which includes allowance for this time. In Leipzig where serious accidents befell workwomen engaged in wool-combing, the inspector has obtained

* Amtliche Mitteilungen aus den Jahresberichten des Gewerbeaufsichtsbeamten, 1895, pp. 31-35; Jahresberichte der K. Preuss. Gewerberäthe, 1895, pp. 15, 37, 313, 413, &c.

† Rechnungsergebnisse der Berufsgenossenschaften, &c., p. 47.

the insertion of a prohibition of cleaning moving machinery in the rules of the trade association.*

Year by year the reports show the familiar risks attendant on the use of hoists and lifts without proper regulation and safeguards. Many of the trade associations have excellent rules, if they were only thoroughly enforced, but others, *e.g.*, the Millers Trade Associations in Baden and Oppeln, are wanting in this respect.†

Some of the regulations of the trade association of the workers in fine metals are such as still remain to be enforced in England if a proper degree of security is to be attained, *e.g.* :—

- “ (1.) Every hoist-well within the factory building must be enclosed on every side.
- “ (2.) The entrances to the hoist on every stage are to be provided with closing doors (in rules of other associations it is provided that these doors shall close as far as possible automatically, and in those, particularly of the South German Textile Association, it is further laid down that these doors shall be such that they can be seen through and cannot be mistaken for ordinary doors).
- “ (3.) Every hoist shall be fitted up with signals which indicate when the hoist is in motion.
- “ (4.) Notices must be placed on each door of a goods hoist showing :—
“ This hoist carries x cwt.
“ No entrance.
“ Not for persons.
- “ (5.) Passenger-hoist doors must similarly be provided with a notice showing maximum number of persons permitted.
- “ (6.) The use of any hoist is to be permitted as far as possible only to definite persons.”

The Leather Association provides that only those persons who are in charge of the hoist shall be permitted to set it in motion, and the Linen Association prohibits young persons from entering the hoist unless in charge of the responsible attendant.

Nothing less than the strict enforcement of some such rules as these can render the use of hoists or lifts anything but a danger to life and limb of the workers.

The desirability of fencing and otherwise safeguarding machinery before it is sent out from the manufacturer for use, is strongly insisted on by the inspectors. “ It may be remarked that the manufacturers of machinery are taking thought more and more for the safeguarding of the same, but still a great deal remains to be desired” (Pfalz). The desire of the smaller manufacturers to keep down the cost of the machinery, which they are obliged to procure in order to compete with stronger rivals, prevents the makers of the machinery from devising the safeguards as a matter of course, before a special order comes (Schleswig).‡

(For further account of trade association rules see *infra*, Dangerous Trades, p. 167.)

5.—*Special Control of Unhealthy and Dangerous Occupations.*

As already indicated, control of unhealthy occupations is provided for under three separate sections :— A. Means of control.

* Amtliche Mitteilungen, &c., 1895, pp. 293, 334-35.

† *Ibid.*, p. 308.

‡ *Ibid.*, p. 336.

1. Special authorisation.

Under Section 16, certain industries are subject in the public interest to special preliminary inquiry and authorisation, the latter to be granted in many cases only after it has been proved by the factory inspectors that due regard is given in the arrangements to the health and safety of the workers. The following is a complete list of the dangerous trades and processes under this section:

Gunpowder factories; manufacture of fireworks and ignitable materials of every kind; gas works; petroleum distilleries; preparation of tar from bituminous coal; preparation of coke; glassworks; limekilns, brickfields and gypsum furnaces; foundries; iron mills; chemical works of every kind; chemical bleaching works; varnish boiling works; starch factories (exclusive of potato starch); oilcloth, catgut, and roof-felting works; glue, blubber, and soap works; bone kilns (*Knochen Brennereien*), bone drying works; bone boiling and bone bleaching works; wool-sorting and preparing works; tallow works; slaughter-houses; tanneries; flaying-houses; manure works; use of stagnant water for power; malt-curing works; asphalt works and pitch boiling works; straw-paper factories; gut-preparing works; factories in which steam boilers or other iron-plate vessels are set up with rivets; alkali works and works where wood is impregnated with tar; shoddy mills; celluloid works; iron-tube mills; iron ship-building works; tar distilleries and tar water works; cellulose factories; albumen paper works; hide-curing works; lead works; soldering and enamelling works.

2. Special rules to be laid down by the Federal Council for all classes of workers.

The health and safety of the workers is more directly provided for by Section 120e, which gives extensive powers to the Federal Council, or failing that, the central authorities in each State, acting, if it appears desirable, in concert with the accident insurance associations to restrict the hours of labour in unhealthy or dangerous occupations, and to order such arrangements in any occupations as are necessary to carry into effect the general requirements of the law relating to sanitation, morality, and safety (Sections 120d to 120c).

The importance of the principle here laid down cannot be overlooked in view of the similar provision in the English Act of 1895, and it should be remarked, in passing, that although, so far, a maximum working day has only been adopted for women and young persons in "factories," and for men in lead works, an Imperial commission on labour statistics is engaged in inquiry into the question (among others) of what is a sanitary maximum working day for adult workers in general.* The special applications of the powers given in this section to unhealthy occupations will be found in three administrative orders of the Federal Council relating to: (a) *Lucifer match factories* and use of white phosphorous; (b) *Lead colour works* and *acetate of lead factories*; (c) *Cigar factories*; all bearing date July 8th, 1893,† and in certain separate State regulations. These are: (a) a Prussian decree as to silvering of mirrors by mercury process, May 18th, 1889; (b) A Bavarian decree on the same subject, July 30th, 1889; (c) a Würtemberg decree regulating tanneries and for prevention of anthrax, June 1891.

It has recently been officially stated in the *Reichstag* that special rules are about to be laid down for accumulator works, basic slagworks,

* See Reichs-Gewerbe-Ordnung nebst Ausführungsbestimmungen, Berger und Wilhelmi, 1895, p. 211.

† It should be noted that the order regulating the lucifer match works was merely an addition to the law passed in 1884; and the order regulating use of acetate of lead an amendment of the earlier order of 1886.

use of grindstones, printing works, horse hair works, and other dangerous or unhealthy processes.

3. The health (and morality) of women and young persons is further provided for in specially dangerous or unhealthy occupations by Section 139a, which empowers the Federal Council to forbid their employment entirely in such occupations, or make it dependent on stringent conditions. The administrative orders applying these powers relate to : *India rubber works* (July 21st, 1888); *glass works* (March 11th, 1892); *wire-drawing mills* (March 17th, 1892); *chicory works* (*ibid.*); *collieries* (March 24th, 1892); *zinc and lead mines and charcoal works in Oppeln* (*ibid.*); *brick and non-ornamental tile works* (April 27th, 1892); *sugar refineries* (April 29th, 1892); *cylinder works and forges* (*ibid.*); *hackling* and other preparatory processes in textile factories (April 23rd, 1893).

Lucifer Match Factories. Under the law of May 13th, 1884, and Section 16, R.G.O., lucifer matches may only be manufactured in specially authorised factories, devoted to that purpose alone. Further, young persons under 16 may not be employed in "mixing," "dipping," or "drying" rooms, nor children of 13 to 14 years in "boxing" rooms.

The special regulations as to ventilation, separation of the processes, and provision of washing apparatus are very similar to those adopted in the English "special rules," but there are additional provisions, unknown here, for special dressing rooms and use of working overalls, frequent rinsing of the mouth, periodical medical examination of the workers, keeping of complete registers of workers, and provision of special dining rooms by the employer. The official summary of the inspectors' reports in 1893 speaks of a considerable improvement in health of match workers as due to application of the above regulations, and the fact that only one case of phosphor necrosis was reported for the Empire, is specially noted. The year would appear to have been an exceptional one, for three cases for Prussia alone are reported by the inspectors for 1894-5, and the official summary for 1894 states that "so far as could be ascertained," 11 cases had occurred during the year. One bad case in the Schleswig district was declared to have been preventible by a more searching periodical medical examination.*

Another is shown to have occurred in a factory which depended mainly for its ventilation on windows which were closed during cold weather.† In the same year two cases of necrosis are reported by the Bavarian inspectors and, at the same time, the chief among them, resident at Munich, speaks of the defectiveness of statistics as to industrial diseases, and shows the way to a reform in this matter through official use of the sick insurance organisations. He also points out that employers are only too ready to think that they have discharged their entire responsibility in dangerous occupations when they have provided the means of safety for their workers, whereas much educational work, particularly in the case of young workers, remains to be done.‡ Many complaints have been made by employers in different parts of Germany as to the increased costs of production arising from the necessity of replacing young workers and children in different parts of lucifer match

3. Special
rules for pro-
tected persons.

B. Conditions
in special
industries.
(a) Lucifer
match fac-
tories.

* Jahresberichte der K. Preuss. Gewerberäthe, 1895, p. 270.

† *Ibid.*, p. 337.

‡ Jahresberichte der K. Bayerischen Fabriken und Gewerbe Inspectoren, 1895, p. xiv.

works by older and more costly labour. In Anhalt this displacement of child labour is disliked, it is alleged, as much by the working families as by the manufacturers.*

(b) Lead works.

Lead Works.—New establishments in which lead colours or acetate of lead are dealt with during processes of manufacture may, by Section 16 R.G.O., not be opened without authorisation, nor, by Section 19 of the special order of 1893, be set in working order until they have been visited personally and certified by the factory inspector to be in conformity with the order. No worker must be set on by the employer without a certificate from an approved doctor, showing his physical fitness and freedom from alcoholism. Young persons may not be admitted to the works and women may only be employed in the processes which have no connection with the lead products. Workmen in contact with these products may only be employed within a period of twelve hours. Detailed regulations apply to ventilation, space, and methods of working, and it is provided that mechanical methods, freeing the workers as far as possible from the necessity of touching the lead products with hands or clothes, must be used. Overalls, gloves, respirators and head coverings, lavatories and baths, are to be provided by the employers, and their use enforced. Means for rinsing the mouth, soap, towels, &c., are also to be plentifully provided, and employers must take care that each worker has the special outfit, as prescribed (overalls, &c.) for his use only, kept in a cleanly condition. Dressing rooms and dining rooms must be in a part of the works free from lead dust, and be properly heated in cold weather. Medical examination of the workers must take place at least once a month, and a complete sick register be kept, open at all times to examination by the inspector.

Still more stringent rules have been drawn up for application to use of lead colours in the Royal Artillery works at Spandau.

Grave accounts are given by many of the inspectors of the effects on health of the use of lead in one form or another in various industries. A slight decrease in the number of cases of lead poisoning and lead colic is shown by the statistics drawn from the prescribed sick registers since application of the special rules, but the number is still great, and, according to the report from Magdeburg, the registers are not always conscientiously kept.† The inspector in Hanover reported for the previous year on the conditions in a lead and tinware factory where a large number of women were employed in the making of capsules for bottles.‡ “Even those who had only been employed a few weeks had, “without exception, the characteristic blue line on the gums, showing “how poisonous metallic lead is. The capsules are made of lead, which “easily penetrates through the thin surface covering of tin foil.”

The medical officer for the district had already expressed the view that the work was particularly dangerous for young women. The inspector for Breslau, who reports on a white lead factory, where he found the special regulations had been carefully carried out, states that the sick register showed a list of 40 cases of lead poisoning (out of a staff of 56 workers) for 1893–94, and a list of 30 cases of lead poisoning for 1894–95. This factory has been since made the subject of a special medical inquiry not completed at the time of reporting. The severest

* Amtliche Mitteilungen aus den Jahresberichten der Gewerbeaufsichtsbeamten, pp. 69, 70.

† Jahresberichte der K. Preuss. Gewerberäthe, 1895, p. 212.

‡ Amtliche Mitteilungen, &c., cited, pp. 306–7.

single case of poisoning was reported from a vitric enamelling works ; the workman remaining, after several months' medical treatment, permanently disabled in both wrists. He was kept on at the works at a 50 per cent. reduction of wage.

The highest percentage of cases of lead poisoning in 1894 is reported from an electric accumulator works in Charlottenberg, where, out of 17 persons employed in the dangerous processes, 12 had suffered from lead colic, sick insurance money being paid for a total of 420 days. A special inquiry was instituted on these facts becoming known, which was specially directed to consideration of the formation of gases which takes place on the charging of the accumulators. This inquiry was still proceeding when the inspector's report was published. He holds that the specially dangerous operations are, the sifting of minium (*Litharge*) and the pressing in of damp lead oxyde into the lead moulds (*gegossenen Bleirahmen*) with the palms of the hands. This industry is a comparatively new one in that district. In another accumulator works, in the Arnsberg district, the certificate of authorisation contained the condition that young persons should not be employed in the lead processes.* In another works in the Swabia district, where a hot weekly bath had been provided for the workers, which appeared to be sometimes evaded in spite of a system of tickets for checking the same, it was ordered that every worker should be personally conducted to the bath by the bathing master (*Bademeister*).†

Many incidents are referred to by the inspectors which certainly seem to bear out the view enunciated by Dr. Konrad Jurisch, that the German workman is less independent of spirit and more submissive to rule and drill than the English workman, and that, particularly in the chemical industry, there is a closer personal relationship between employers and employed in Germany than England.‡ Through this circumstance, and special conditions arising out of the scattered and unconcentrated character of the chemical industries, Dr. Jurisch holds : " So high a degree of security against injuries has been attained in the German chemical factories, and the arrangements for aid in case of accident have been so highly developed that the general factory hygiene in these industries have long surpassed that which still obtains in England." Still, that much remains to be done even in this sphere in Germany is evidenced (for example) in the references of the inspectors to the sufferings of workers in the chromate factories, where perforation of the membrane of the nose, burnings of the skin, and abscesses of various kinds, are of frequent occurrence.§ The reports of the inspectors appear to have led, first, to a closer medical supervision of the workers ; and, secondly, to institution of a special inquiry by the Minister of Commerce and Industry in Prussia. The recommendations are : (1) Strict preliminary medical examination of all workers and rigid exclusion of all scrofulous, delicate, or peculiarly sensitive persons ; (2) Minutest precautions against spreading chromate dust or vapours, and provision of proper guards for hands and feet of all workers coming in contact with corrosive or concentrated salts ; (3) Greatest personal cleanliness, including frequent bathing for the workers and the immediate expert treatment of the smallest skin wounds.||

Chromate factories.

* Jahresberichte der K. Preuss. Gewerberäthe, 1895, pp. 126, 113, 400.

† *Ibid.*, p. 342.

‡ Über Gefahren für die Arbeiter in chemischen Fabriken, Berlin, 1895, pp. 80-84.

§ See e.g., Jahresberichte der K. Bayer. Gewerbe Inspectoren, 1895, p. 116, and Jahresberichte der K. Preuss. Gewerberäthe, 1895, pp. 224, 502.

|| Jahresberichte der K. Preuss. Gewerberäthe, p. 502.

In Saxony a similar investigation into the conditions in chrome yellow colour factories has been instituted.*

Cigar Factories.—Women and young persons may only be employed in cigar works under a direct contract with the manufacturer, and never by sub-contract through employees; further, they may not be employed in cigar works unless separate lavatories and dressing rooms for the sexes have been provided. Special clothes are to be worn during work, and the clothes laid aside during work must be kept in the dressing rooms, or in the closed cupboards. A copy of the special rules must be affixed, and a notice must be hung up at the entrance to the work rooms, showing the length, breadth, and height, and cubic provision of air, with number of workers, to be checked by the police authorities. For each worker there must be at least 7 cubic metres (247·22 c. ft.), and the rooms must be at least 3 metres (9·10 ft.) in height, and amply provided with windows which open. Workrooms may not be used as living rooms, warehouses, nor as drying rooms, and the amount of material to be admitted during working hours is strictly limited. Floors and work-tables are to be thoroughly cleansed, at least once a day with damp cloths, and during meal times and after working hours the rooms must be thoroughly ventilated by opening every window and exclusion of every worker.

Marked improvements in health and surroundings of cigar workers are reported by the factory inspectors in many districts in consequence of enforcement of the detailed provisions of this administrative order. Many of the smaller cigar factories have been improved and enlarged, or rebuilt. In West Prussia the industrial councillor reports that the cigar factories stand out amongst other factories in respect of the arrangements for separate dressing rooms and lavatories.† Many rooms have been condemned as too low or insufficiently ventilated in the Lüneberg district. In other districts, e.g., Minden, the cigar-making industry is largely a domestic one, and the condition of the out-workers is pitiable (*recht traurig*). The inspector for the same district has waged an almost fruitless war against the habit the workers have of finishing the ends of cigars by rolling them between tongue and lips, a habit which we have also room to improve upon in England. On repeated visits the employers would affirm that the practice had ceased, a statement which the inspector pointed out could be disproved by a few moments' presence in the workrooms, even where the appearance of the workers' mouths did not already offer a contradiction. "It is urgently to be desired that the cigar manufacturers should act energetically in this matter for the protection both of workers against nicotine poisoning and smokers against danger from infectious diseases."‡

(d) India-rubber Works.—Since July 1888 the employment of women and young persons has been prohibited in the preparation of "preservatives" in these factories.

In Berlin and Charlottenberg the inspectors have further ordered special precautions for the protection of workers in the rooms where they are exposed to the bi-sulphide of carbon fumes, and also against the breathing in of dust where articles are powdered with French chalk.§ On the initiative of the inspector in Cologne the vulcanising process has been rendered harmless by "enclosing the articles in a

* *Jahresberichte der K. Sächs. Gewerberäthe*, p. 236.

† *Jahresberichte der K. Preuss. Gewerberäthe, &c.*, 1895, pp. 19-20.

‡ Report cited, p. 389.

§ *Ibid.*, p. 111.

" hermetically closed case in which a small portion of moistened bi-sulphide of carbon has been placed. As soon as the vulcanising has been completed by the fumes the case is connected with a ventilating chimney so that the workroom remains almost free from fumes."*

Glassworks.—Women may not be employed in work organised in the (e) Glass neighbourhood of the furnaces, e.g., smelting, tempering, annealing, nor works. may they stay in rooms of an exceptionally high temperature. Boys under 14 and girls under 16 may not be employed in grinding (*Schleifarbeiten*). In plate-glass works boys may not be employed in the work of smelting or annealing, nor may they be employed where the cylinders are of more than 5 kilograms weight. A special medical certificate of fitness is required in the case of all young persons before commencement of employment in the processes which are not prohibited. Hours of labour—(1) for boys of 13 to 14 years may not exceed 6 in the 24, or 36 in the week ; (2) for young persons, may not exceed 10 in the 24 (exclusive of pauses), or 60 in the week. No pauses are reckoned which are of shorter length than 15 minutes, and one pause at least must be of 30 minutes duration.

Special reports are given by the inspectors on the application of the order relating to glassworks. The inspector for Minden found during 1894 that out of 12 works only 3 had procured the required medical certificates for young persons employed, in the prescribed form, in the remaining cases they were wholly wanting or irregular; on the other hand he found no women or young people employed in prohibited processes.† The inspector for Trêves remarks on a similar condition of things, and shows further that there is frequent irregularity as to the notices and abstracts of the special rules. In the majority of these cases the irregular notices bore the stamp of the local authorities.‡ The inspector for Altona (Schleswig) found that provisions for protection from dust were very inefficient in a glass frosting works (*Glasmattirungsanstalt*). Some of the work can be done in closed boxes, but for much of the work the proper protective measures remain to be discovered. His opinion is that this is a case for exclusion of young people under 18, in accordance with provisions contained in Section 120c, R.G.O.§ A new process is being tried by Messrs. Guttman in Altona, which sets the sand in motion by suction and prevents the dust from entering the workroom.||

Rolling Mills and Foundries.—The order of April 29th, 1892, forbids (f) Rolling the employment of women in the main processes in rolling mills and mills, &c. foundries, and entirely excludes children under 14 from these works. Special arrangements as to shifts and pauses are prescribed for male young persons over 14 years.

Wire-drawing Works. By the order of March 11th, 1892, women, (g) Wire-female young persons, and children may not be employed in any wire-drawing works. drawing mills driven by water power where regular shifts of equal duration cannot be properly organised.

Brick Works and Non-ornamental Tile Works.—Women and young (h) Brick persons may not be employed in the transport of raw materials at the works. furnaces or in the neighbourhood of the furnaces, nor in moulding of

* Amtliche Mitteilungen, &c., cited, p. 331.

† Jahresberichte der K. Preuss. Gewerberäthe, 1895, p. 372.

‡ Ibid., p. 538.

§ Ibid., p. 272.

|| Ibid., p. 111.

bricks by hand (for hours, *cf. infra*, p. 172). In spite of a double control of brickworks—(1) through their subjection to preliminary authorisation (Section 16); (2) through the special order just referred to—the inspectors' reports disclose exceedingly bad conditions in too many of these places. It is noteworthy that in a great number of small brickworks the workwomen were irregularly employed overtime, although the employers possessed copies of the special order. In many cases excuses were made by employers to the effect that the women desired overtime, and could not endure to have extra workers taken on when work was plentiful. It was hardly recognised anywhere that for overtime a special permit was necessary (*Anhalt*).^{*} The restrictions on child-labour are still far from being thoroughly observed, and the complaints both of workers and employers on account of these restrictions are frequent.[†] “A greatly increased activity in supervision of the brickworks “on the part of the police authorities is of pressing importance, for the “same infringements are found year by year in the same establishment, “where often Dutch or Belgian contractors are in charge without “sufficient knowledge to carry out the prescribed orders” (*Düsseldorf*).[‡] Many of the inspectors draw attention to the peculiarly unhealthy influences of the gases and dust near the furnaces, and a special disease is referred to as *Ziegler Krankheit*, a form of anaemia. In some cases special conditions have been laid down in the authorisation certificates, such as provision of dining rooms for the workers, properly warmed, and of sufficient size (*Koblenz*), or, where sleeping accommodation is provided, that it shall be erected out of reach of the dust and unhealthy gases.[§]

(i) Chicory works.

Chicory Works.—Women and young persons may not be employed in the drying rooms in chicory works (*Darrenbetrieb*). In the rooms where other processes are carried on notice of the prohibition must be affixed if women or young persons are employed. This order of 1892 appears to have been carried into effect with very little trouble. The inspector for the Pfalz mentions a displacement in one case of 12 woman by 9 men.||

(j) Sugar factories.

Sugar Factories and Sugar Refineries.—Employment of women and young persons is absolutely prohibited in the washing and soaking of beetroot, on the hoists, or in transport of the beetroot on trucks. Their employment is also prohibited in the filling house (*im Füllhause*), in the centrifugal rooms, the crystallising, the drying, and washing rooms, and other places where the heat is great, a longer period was allowed for carrying this prohibition into effect than in the case of the first mentioned. In the remaining processes the hours are specially regulated and shifts are permitted in certain cases for night work of women over 16, under the close supervision of the inspectors. The lighting and ventilation of these factories are particularly regulated, and the rooms are to be ventilated with warm air in winter. Separate dressing rooms, lavatories, and dining rooms warmed in winter, must be provided for the women. The “higher authorities” may order arrangements for special provision of food and drink. The sanitary conveniences are to be properly lighted up at dark, both inside and outside, and be so placed that the workers can reach them from the heated rooms without

* Amtliche Mitteilungen, &c., 1894, p. 191.

† *Ibid.*, pp. 66, 189, &c., also Jahresberichte der K. Bayrischen Gewerbe Inspectoren, 1895, p. 95.

‡ The same for Prussia, p. 470.

§ Amtliche Mitteilungen, &c., p. 338.

|| Jahresberichte der K. Bayrischen Gewerbe Inspectoren, 1895, p. 98.

danger of taking cold. As the factory inspector for Breslau points out, this order, if taken with the power given by Section 16, &c., preliminary authorisation would effect important changes making for the health of the workers, and he considers that the sugar-refining industry is distinctly one of those which should be classed as unhealthy and dangerous in Section 16. The powers to enforce provisions of the order of 1892 are so far no more direct for the inspectors than in other cases, but nevertheless much has been done by them for improvement in matters of sanitation. In Merseburg and Erfurt certain employers have been persuaded to erect douche and shower baths for the workpeople. In the Magdeburg district the dining rooms and living rooms for migrating workers have been improved. From Danzig it is reported that the dust in the grinding rooms is so great that a very short stay brings on coughing. One worker had sought to protect himself by binding muslin over his mouth, but his "unhappy looks" showed that the service was slight. The manager of the factory tried to attribute the dust to unusually bad atmospheric conditions at the time of the visit.* The inspector for Oppeln reports that some success has attended his efforts to secure better ventilation and lowering of excessive temperatures. "The statement of many directors that in certain processes the temperature is necessarily high is contradicted by the fact that in similar rooms in other factories a cool temperature is maintained."† The inspector for Posen writes: "In a sugar factory where an excessive number of accidents (especially in connection with the use of locomotives) occurred, I paid several night visits. I convinced myself that the general system of lighting was thoroughly bad, both in the factory and in the courtyard; while in the latter, impediments of every kind were scattered in confusion on the pathways and truck lines, and at the entrance to the factory, stopping the free ingress and egress of workers in a most serious way. No wonder that accidents frequently occurred. Before the next busy season the miserable gas lights will be replaced by electric lights, and the lighting of the court-yards will be particularly arranged. I have also required improved control of the entrances and the passages."‡

Hackling and other Preparing Rooms in Textile Factories.—In (k) Hackling, hacking rooms, as well as rooms in which machines are used for grinding opening, loosening, grinding, dusting, greasing, or mixing of raw or used textile fibres or cast materials or rags, young persons may not be employed, nor their presence permitted whilst manufacturing processes are carried on. "This prohibition does not apply to cards for wool or cotton."§ An amendment to the last clause is proposed by the inspector for Hanover. "Cards for cotton and machines for preparation of cleansed wool do not fall under the prohibition; but young persons shall not be employed in tending the openers (*Sogenannte Wölfe*)."[¶] The amendment is proposed to meet the cases of hardship arising in small textile factories where openers and other similar machines are at work in the same rooms with spinning machinery, and where, in consequence of the order, many young piecers have had to be dismissed.|| Claims for exemption from the order have been put forward by various jute manufacturers who were found to be infringing the order by employing young persons in carding rooms. In the Potsdam

* Amtliche Mitteilungen, &c., p. 328.

† Jahresberichte der K. Preuss. Gewerberäthe, 1895, p. 32.

‡ Ibid., p. 133.

§ Order of April 29th, 1892.

|| Amtliche Mitteilungen, &c., p. 122.

district, in a very large jute spinning and weaving shed, the inspector proposed to meet the difficulty by separating the processes with a thin wooden partition. The manufacturers objected to the cost, and invoked the aid of the German Association of Jute Manufacturers to carry the case before the Imperial Chancellor and the Prussian Minister of Industry. At the time of reporting no final decision had been received.*

C. Individual control in various industries by inspectors and local authorities.

(a) Shoddy mills.

Many examples may be cited from the inspectors' reports of the good work effected in individual factories through exacting proper conditions for workers before granting authorisation in unhealthy industries. In a *shoddy mill* in Minden, for example, it was required (1) that moveable screens should be provided in front of the hydro-chloric acid stoves for the protection of workers engaged in the carbonising processes; (2) that workers should be supplied with protective mouth sponges or cloths; (3) that the carbonising drum should be thoroughly purified by an exhaust ventilator, (4) that dressing and dining rooms, properly warmed, should be provided for the workers.† In connection with carbonising of rags a special process is recommended by the inspector for Aachen, which has been patented by the inventors, Messrs Schüll Bros., in Birkesdorf. The carbonising drum is made, not, as formerly, of plate iron, but of woven wire work, so that the rotation causes the corrosive dust to fall to the ground as fast as the process is completed; the dust is then drawn off in a groove. The heating is carried out by means of smooth iron pipes along the walls. Not only does this method leave the carbonised material free from poisonous dust for subsequent processes, but it also prevents the explosions which are so frequent in the ordinary methods.‡ In East Prussia there are great rag sorting and shoddy works, in which numbers of men and women are constantly employed. The industrial councillor, on the report of the inspectors as to dirtiness and danger of infection in the work, after the death of a workwoman from blood poisoning, saw the necessity for provision of satisfactory dressing rooms and lavatories, and drew the attention of the police president to the matter. The employers were then ordered by the police to carry out the necessary alterations.§ In the district of the inspector resident at Munich, illnesses among workers in rag sorting workshops (Upper Bavaria) were found, and on the recommendation of the Hygienic Institute of the Munich University, general instructions were given that a good method of disinfection would be found in compressed steam of a temperature 103° Centigrade, the atmospheric pressure being 0·25.||

(b) Flock and feather works.

The inspectors for Schleswig and Mecklenburg-Schwerin speak of efforts to improve the sanitation in the cleaning rooms of the flock and feather mattress works. Better machinery is coming into use, and ventilation is being organised, but much remains to be done, although special affections of the breathing organs are certainly less frequent than they were,

(c) Bronzing in chromolithography.

The harmful effects of bronzing work are referred to by several inspectors. A special case is quoted from a chromo-lithographic works. There some workwomen were employed in sprinkling burnt and powdered magnesia on the bronzed sheets to prevent their sticking.

* Jahresbericht der K. Preuss. Gewerberäthe, 1895, p. 42.

† *Ibid.*, p. 388.

‡ *Ibid.*, p. 564.

§ *Ibid.*, p. 10.

|| Jahresberichte der K. Bayrischen Gewerbe Inspectoren, 1895, p. 20.

Four of the women so engaged were taken ill in one day, and the dust penetrated to other workers, of whom one was taken ill. Although the work was carried on in an airy shed opening on to the courtyard, further illness occurred. The symptoms were fainting fits and general *malaise*, accompanied by lassitude in the limbs. Under medical treatment with a milk diet the patients recovered. The employer was directed to carry on this work only in a place provided with an exhaust ventilator, and to set on only workers of sound constitution, who were moreover to be provided with milk during their work. The results have been very satisfactory, and it seems clear that breathing in of the combined bronze and magnesia dust was the sole cause of the illnesses.*

In no occupation have the harmful effects of dust been more strongly (d) Basic remarked by the inspectors than in basic slag works (*Thomas-Schlacken* slag works. *Mühlen*). The inspector for Dortmund found in one case, where he had occasion to draw the attention of the district physician (*Kreisphysikus*) to the inadequate condition of the mechanical ventilators, that after ten minutes' presence in the dusty room he and the doctor were seized with attacks of coughing, which lasted on and off for several days. Although the change of workers is frequent in these mills, the deaths from inflammation of the lungs were five in one year. Other workers would suffer the evil consequences after taking up another occupation. The report of the doctor and inspector led to a temporary closing of the works by the district president (*Regierungs-präsident*). During a four weeks' interruption of work the exhaust ventilators and dust filter towers were thoroughly overhauled. The after events showed most satisfactory results.† It is remarked in the Rührort slag mill that humid weather decreases sickness, especially in the phosphate department; although the number of workers increased during the year 1894–95, deaths fell from three to one, and the total sick days from 1,128 to 891. In the Frintrop mill there were six cases of inflammation of the lungs and 24 of bronchial catarrh out of 71 cases of illness. The inspector for Trèves states that on a surprise night visit he found the workers engaged in cleaning the dust chambers, and although the air was so thick that the lights could hardly be discerned, all the respirators were hanging neatly (*säuberlich*) on the walls.

The recommendations for the slag works are: (1) that special rules should be ordered as in the case of works where lead is used; (2) that young persons should be excluded from dusty processes; (3) that adult workers should be subject to preliminary and periodical medical examination; (4) that special dining rooms and bathing conveniences should be provided for workers; (5) that special notices should be affixed by the dust chambers, giving particular instructions for cleaning them.‡

Year by year reports are made by inspectors on dangerous processes (e) Dry in chemical cleaning works. Sometimes benzine fumes find their way cleaning works. through broken panes to the boiler-house and there take fire, as, for example, is reported from Cologne; sometimes the woollen stuffs, on being packed into the cleaning drum, are set on fire by a neighbouring centrifugal machine, as is reported from Schleswig; sometimes in rubbing the well-dried woollen stuffs which have first been cleansed by benzine, currents of electricity are set up—as in a Leyden jar—so that

* Amtliche Mitteilungen, &c., p. 193.

† *Ibid.*, p. 314.

‡ Jahresberichte der K. Preuss. Gewerberäthe, 1895, pp. 500, 539, 546–7.

the mere contact with a worker's finger nails is sufficient to set the whole material in a flame. "If cleaning benzine (*Waschbenzin*), to which *antibenzin pyrin* is added, is replaced by sulphuric acid, the stream of electricity is stopped, because a separation of stearin acid takes place under the action of soluble sulphuret of magnesium. Since water is a good conductor of electricity, it is to be recommended that the air of the workrooms should be kept as damp as possible."*

(f) Industries in which anthrax occurs. The following table summarizes the information given by the inspectors as to the cases of anthrax occurring during 1894-5 :

District.	Total number of Cases of Illness.	Fatal Cases.	Industries Concerned.		
			Horse hair Spinning.	Brush Works.	Tanneries.
Arnsberg	-	2	1	—	1
Schleswig	-	1	1	—	1
Cassel	-	6	2	5	1
Middle Franconia	-	5	1	—	5
Lower Franconia	-	4	—	4	—
Baden	-	1	—	1	—
Hamburg	-	1	—	—	—
Total	20	5	10	7	2

The case in Baden although not fatal resulted in complete incapacity for work. One of the cases in a horse-hair spinningry at Cassel occurred in the boiler house, the man in charge being attacked by an anthrax carbuncle in the face. This, taken with other evidence, goes towards showing that the bacillus is carried in the air with dust. Still more important was the report from Cassel in the previous year 1893-4, where two workwomen died, out of four attacked, in a horse-hair works. The inquiry showed that the police regulations for the protection of the workers had been observed, and that in three out of the four cases the women had been employed in 'cleaning the rooms. The inspector then recommended that before sweeping the rooms a thorough sprinkling with fluid disinfectant should take place (e.g., with a solution of Lysol 25 p.c. in water), and that exactly the same protection should be afforded to the women cleaning rooms, such as special overall clothes and baths for thorough cleansing of the body, as in the case of workers dealing with suspected materials. In the factories where cases of anthrax have occurred during 1895, special bath and dressing rooms and dining rooms have been ordered. "In most cases illnesses arise in factories where foreign hair and fleeces are used, and it is clear that the diseases may be most effectually dealt with by thorough disinfection at the points of entry into the country.†

(g) Laundries. A special inquiry was made into the laundry industry at Kiel by the district inspector with the assistance of the doctor to the sick insurance fund. It appeared that 36 per cent. of the laundries belonging to the sick fund came upon its resources in the year, with an average of 23 days illness each; the sorters and washers appeared to be most liable to

* Amtliche Mitteilungen, &c., 1895, pp. 323-4.

† *Ibid.* 1894, pp. 340-1; 1895, pp. 351-2.

infectious diseases, such as diphtheria, sore throats, scarlet fever, measles, &c., and the ironers to affections of the breathing organs. A great number of young girls between 16 and 20 years suffer from anæmia, which seems chiefly traceable to over-exertion of the body. The conclusion of the inspector was that some special regulation of the industry as a particularly unhealthy one was called for by these statistics. Protection of the sorters against infectious diseases seemed to him to be one of the most necessary reforms.*

Although a detailed account of the regulations laid down by the trade associations is rather outside the scope of this *précis* it is, as I have already attempted to show (*supra*, pp. 140, 152, & ff.), important to take account of this indirect form of state control of dangerous or unhealthy industrial processes. It is proposed here to emphasise the extent of this control: first, by drawing attention again to the fact that *all* industries are subject to detailed practical regulations under supervision of the employers' associations, and that some of these regulations, especially in the chemical, metal working, and wood working industries, are of a most valuable character; secondly, by reproducing two examples of the special rules introduced, in addition to general control of machinery, workrooms, &c., in dangerous occupations.

1. Mineral Water Works.—These factories are under the general control of the Trade Association for Chemical Industries, and the rules which apply as to lighting and arranging of workrooms, guarding of machinery, use of hoists, &c., apply here as in every other case. “Besides the rules for prevention of accidents laid down by the Trade Association for the Chemical Industries, the following hold good for mineral water factories:—

A. Rules for Employers.—Section 1. The rooms in which mineral water is made must be so lighted and arranged that the apparatus can be seen from every side.

Section 2. The apparatus must be constructed with sufficient resisting power, and particularly, the developing vessels must be so constructed that the interior of the vessel can be seen.

Section 3. The maximum pressure for the self-developers is to be legibly indicated in such a way that it is irremovable on the developing and the mixing vessel.

Section 4. In case of apparatus worked by gasometer (hand or power) the mixing vessels, and the developing vessels of the self-developers, must be provided with manometer and safety-valve. Care is to be taken that the latter is kept in working order.

A mark on the manometer shall indicate the maximum pressure permitted.

Section 5. Use of pump with fly wheel is to be guarded by narrow meshed drawn wire netting.

Section 6. The apparatus and retailing vessels (*Ausschankgefässe*) must be tested in an expert manner by the $1\frac{1}{2}$ -times pressure test before being set in use.

This test must be repeated every second year, and the proofs of the test are to be open to the examination of the trustees.

Faulty apparatus which may be a cause of danger must be immediately put out of use by the employer. In any case this must be done without delay if the trustee gives notice that it is necessary.

* Jahresberichte der K. Preuss. Gewerberäthe, &c., 1895, p. 27.

All soldered edges in the apparatus and retailing vessels shall be fastened with rivets.

Section 7. Care is to be taken that the introduction of acids into the developing vessel is effected gradually, and in no case shall the whole be poured in at once. The vessel containing the acid shall be so formed that the rate of pouring can be controlled.

Section 8. In filling and wiring of the bottles the workers must be provided with masks and spectacles, as well as leather or india-rubber hand coverings fastening close to the wrist, and aprons made of leather or other strong material.

Section 9. Filled carbonic acid flasks and filled retailing cylinders (*Ausschankylinder*) are to be protected from the rays of the sun or other sources of heat.

Section 10. Where liquid carbolic acid is used there must be either a valve for reducing pressure or an expansion vessel of at least 100 litre cubic contents between the flask and the mixing vessel. The expansion vessel must be provided in every case with manometer and safety valve.

Section 11. Every mineral water manufacturer is bound to affix these regulations in a suitable place in a legible condition.

B. Rules for Workers.—Section 12. The safety valve in the developing vessels must not be overcharged or choked, and must be maintained in working order.

Section 13. The same as Section 7, first clause.

Section 14. The same as Section 8, substituting "wear" for "be provided with."

Section 15. The same as Section 15.

Sections 16, 17, and 18 provide for the enforcement of these rules. Employers who neglect them may be condemned to pay double their ordinary contribution to the Trade Association (U.V.G., Section 78). Workers insured infringing the rules, or neglecting to use the protections provided, may be fined to the extent of six marks, payable to the ordinary sick insurance fund.

These regulations were authorised by the Imperial Insurance Office, June 24, 1891.*

2. Processes where mercury is used.—The only regulations are those laid down by the Trade Association of Workers in Refined Metals, and are as follows:—

Section 1. Rooms in which mercury processes are carried on are to be particularly well ventilated and maintained cool in temperature.

Section 2. The floors are to be close, free from cracks and crevices, and must be moistened with water at least three times daily.

Section 3. All such workplaces are to be provided with sufficient lavatory apparatus for the number of workers.

Section 4. The workers are to maintain the greatest personal cleanliness and to repeatedly rinse the mouth.

Section 5. The workers are to be supplied with proper means for this rinsing of the mouth.

Section 6. The workers must wear special clothes or overalls at their work which shall be kept at the factory. These clothes shall be frequently washed.

Section 7. Eating and drinking shall not be permitted in the workrooms.†

* Über Gefahren für die Arbeiter in Chemischen Fabriken, Dr. Konrad Jurisch, p. 122.

† Die Unfallverhütungs-Vorschriften. R. Platz. Vol. II.. p. 128.

6. Employment of Protected Persons.

From the point of view of duration of work the Industrial Code A. Provisions distinguishes three classes of protected persons, viz., children from 13 of the Code. to 14 years, young persons from 14 to 16 years, and women over 16 General scope of years. So far as the same regulations apply to both, children and young of provisions. persons are classed together as "youthful workers," and special exceptions in some cases practically extend the limit of 16 to 18 years of age.

The extent of the protection as to hours is limited in a manner which to English workers would appear to be extremely unfortunate by the fact that it applies only in "factories," already shown to be an incompletely defined term.*

Generally, however, it may be first noted that employers who have been deprived of their civic rights (*Bürgerlichen Ehrenrechte*) are also debarred from employing persons under 18 years of age (R.G.O., Section 106). Further, it is specially provided that children may not be employed in any industrial occupation connected with itinerant trades (R.G.O., Section 62). No person under age may be employed in any way until a labour-book (*Arbeitsbuch*), stamped by the local authorities, has been delivered to the employer, who is bound to ask for it when engaging, and to return it when parting with, the worker. The labour-book must state the name and date of birth of the person, his religious denomination, and the name, calling, and residence of the parent or guardian; it is supplied cost and stamp free by the authorities to the worker. Proof must be given that further attendance at an elementary school is not required, and it should be here noted that the educational standard varies in and is fixed by the separate states. The employer has to complete the entries by filling in the date of commencement of employment and the nature of the work to be done. When the worker leaves his service the employer must enter the date, and is expressly prohibited from making any further entry or mark in the labour-book (R.G.O., Sections 107-114).

Children under 13 years may not be employed in "factories," and over 13 years may only be employed when freed from attendance at an elementary school. Their hours of work in factories may not exceed six in the day, while those of young persons may not exceed ten in the day. The period may not begin before 5.30 a.m. nor end later than 8.30 p.m. Regular pauses during work hours must be observed; for children there must be a pause of at least half-an-hour in the six; for young persons a mid-day pause of one hour at least, and morning and afternoon pauses of half-an-hour each at least must be fixed. During these fixed pauses children or young persons may not be permitted to remain in workrooms unless all work is at a standstill, and then only if it is impossible for them to be out in the open air, or in special waiting rooms (R.G.O., Sections 135-136). A *pause* is defined as a cessation of work and no subsidiary occupation must be carried on outside the factory, such as carrying of materials; a shortening of work-hours by half-an-hour at the beginning or end of the period is not a *pause* (*Reichs-Gericht*, October 28th 1890). Employment is forbidden for "youthful workers" on Sundays, holidays, or during hours fixed by

Employment of "youthful workers."

* In a debate in the Reichstag, January 15th 1896, on amendment of the Code, it was stated by the Freiherr von Stumm that the aim of the imperial party (Reichspartei) was to bring the smaller industries under the law in such a way as to prevent further development of domestic industries without destroying them: *Soziale Praxis*, January 23, 1896, p. 471.

pastors and priests for catechising, for confirmation or communion classes, or for confession. Further, employers are bound to afford their workers under 18 sufficient time to attend recognised continuation schools if they desire it (Sections 105a and 120). In Würtemberg a law has been passed in 1895, making attendance at continuation schools during the day time compulsory until the sixteenth year.*

**Employment
of women.**

Women may not be employed in "factories" for more than 11 hours daily, beginning not earlier than 5.30 a.m. and ending not later than 8.30 p.m., and they may not work longer than ten hours, nor later than 5.30 p.m. on Saturdays and eves of holidays. A mid-day pause must be fixed for them of not less than one hour, but women over 16 having the care of a household shall be given, on applying for it, an extra half-hour at the beginning of the mid-day pause. No woman shall be employed within four weeks after giving birth to a child, and then only on producing a certificate of fitness from a recognised doctor; without such a certificate the prohibited period is six weeks (R.G.O., Section 137).

The prescribed notice of employment of protected persons (*cf. supra*, p. 140) states the beginning and ending of periods of employment and of pauses. Changes may only be made after a fresh notice has been affixed and served in a similar manner on the authorities. A list of children and young persons must be affixed in a conspicuous place in the factory showing their periods of employment and pauses. An authorised abstract of the provisions of the Code applying to all protected persons must be similarly affixed (R.G.O., Section 138).

Exceptions to the regulations as to pauses for protected persons can be permitted on application, in individual factories, by the "higher authorities" on grounds of the peculiar nature of the work or out of consideration for the workers, and on the same grounds special orders as to periods and daily hours may be made by the Imperial Chancellor (Section 139). The permission for such changes to apply to given branches of industry throughout the Empire can be decreed by the Federal Council, and this power has been exercised in the case of spinneries (December 8th, 1893). Notices of intention to make use of the exception must be under control of the police authorities.

(ii.) Overtime.

Overtime, extending the working hours to 13 for women over 16 on the week days, *exclusive of Saturdays*, may be granted in individual factories by the local authorities, on the grounds of "exceptional pressure of work." The permit must be in prescribed form and may not exceed ten successive full working days, *i.e.*, a fortnight, exclusive of Saturdays and Sundays. A fresh permit cannot be issued to the same factory (within a calendar year), except after the ordinary working has been resumed, and on proof of a fresh cause of pressure; the total number of days on which overtime is so permitted must not exceed forty in a calendar year. The "higher authorities" may on application grant an extension of the overtime exception to more than forty days in the year or more than ten successive ordinary working days, if the *average* working day throughout the year inclusive of the overtime does not exceed 11 hours. For such cases a detailed statement of work (*Betriebesplan*) has to be supplied by the employer for the whole year; and this holds good if a claim is advanced for even forty-one days' overtime. The official circular of February 28th 1892, points out that so-called "season" industries, which are carried on generally throughout the year, but are subject to increase at certain recurring periods, are under exactly the same obligation to prove exceptional pressure as all

* *Soziale Praxis*, July 22, 1895, p. 804.

other industries if overtime is sought. No employer can advance an *à priori* claim to overtime as in England. The pressure must be of a kind which cannot be foreseen nor provided against in the quiet times. The question suggests itself: How is it possible for an official to test the proof offered by a manufacturer? Practically, however, the tendency of the principle laid down is to lessen the amount of overtime. The number of official refusals to grant overtime increased by over 35 per cent. for Prussia, and over 72 per cent. for the Empire in 1894 as compared with 1893. Care is to be taken by the local authorities not to grant the exception if a presumption against its necessity is shown by ability to dispense with it by other employers within the limits of the same industry. The claim is to be readily acknowledged in the case of perishable articles. In general the permit is to be refused when an employer has voluntarily undertaken extra work in his own interest without any pressure of public or outside interests.*

Overtime from 5.30 to 8.30 p.m. (but not later) on Saturdays and eves of holidays may also be granted by the local authorities for women over 16 who have no care of a household and who are not attending any continuation school. This exception must be based on the same reasons as those which hold good for Sunday and holiday labour of adult workers generally, such as:—

1. Work undertaken in cases of exceptional need or prevention of danger or in the interest of the public, *i.e.*, of the State or Commune.
2. Cleansing, repairing, and preparatory work which cannot be done within ordinary hours and on which the continuance of the factory work depend.
3. Work for prevention of injury to materials which cannot be done during ordinary hours.

This permit is to be refused to employers convicted of infringements of the regulations as to truck, or regulations protecting women and young workers, or who have given ground in any other way for believing that they will not conscientiously observe the conditions of the exception. As in other cases of exception, the permission must be in prescribed form and be produced to the inspectors at their request.

Exceptional extension of the hours of work for all protected persons, involving even night work and interference with pauses, may be permitted in any factory when ordinary work has been dislocated through natural forces or accident. Such an exception can be granted for four weeks by the higher administrative authorities or for a longer period by the Imperial Chancellor. In cases of sudden need the local authorities can grant this practical extension of the law for 14 days. (R.G.O., Section 139.) The circular above cited lays down that the exceptions should, if possible, be maintained within the following limits: (a.) Children to be employed for not more than 9 hours, young persons not more than 11 hours, and women not more than 13 hours in the 24, exclusive of pauses; (b.) between two periods children to have a rest of not less than 12 hours, women and young persons not less than 10 hours; (c.) day and night shifts to change weekly, and a pause or pauses of at least one hour to be given in each shift; (d.) on a Sunday or holiday (*Festtag*) work to cease from 6 a.m. to 6 p.m.

This exception is distinct from the power given to the Federal Council to make permanent special provision for certain branches of industry, altering periods and permitting night work for protected persons, *e.g.*, in rolling mills and foundries, in wire-drawing works, in glassworks and brickworks (R.G.O., Section 139a, Orders, April 27

* Reichs Gewerbe Ordnung von Illing. Berlin, 1895, pp. 135-7.

and 29, 1893, and March 11, 1892). The exceptions in these cases are mostly applicable to the employment of male young persons, and the limits of 12 hours' work in the 24, and 60 hours' work in the week are to be observed. In *brickfields*, where employment of women as well as male young persons is permitted in certain processes (not in transport of raw material nor at the furnaces, nor in moulding of bricks by hand), it is provided that work, with those restrictions, may not begin earlier than 4.30 a.m. nor end later than 9 p.m., nor may work be continued for longer than four hours without a pause of at least half an hour. Changes may be made in the notice affixed as to period, on account of conditions of weather, without special notification to the authorities. A record of these alterations must be, however, kept affixed for a fortnight from the time of alteration.

The exception as to *spingeries* is as follows:—

The afternoon pause for children and young persons may be dispensed with if the period ends at 5.30 p.m., and if the total number of working hours has not exceeded $9\frac{1}{2}$ nor the afternoon period 4 hours. On these days the young workers must be permitted to take their afternoon meal (*vesperbrot*) during work.

For an account of the special restrictions as to female and child labour in individual industries, reference must be made to the section on dangerous or unhealthy industries (*supra*, p. 156 & ff.). Provisions in the Industrial Code for safety, sanitation, and morality apply to all workers alike, and are not imposed in the interests of any specially "protected" classes of workers. It has already been seen, however, that the employer is more particularly bound to make any and every arrangement desirable in the interests of the health, safety, and morality of persons employed under 18 years of age.

B. Operation of the provisions.

Statistics are not given in the official extracts from factory inspectors' reports which would throw full light on an inquiry as to the numbers of women and young workers employed in the industrial establishments not classed as factories, and therefore unrestricted as to periods of employment. The question is one of the greatest importance, and the elaborate tables showing, (a) numbers of workers employed in establishments visited by the Government inspectors, (b) numbers of women and young workers employed in "factories" throughout the Empire, interesting though they are, unfortunately leave us no nearer to a conclusion. The last census of occupations in the Empire (June 1895) will be of the greatest assistance in clearing up this point, but its results cannot be published for some months yet. Some preliminary results are given in the *Vierteljahreshefte zur Statistik des deutschen Reichs*, 1895, IV., which show that industrial establishments have increased by 131,126 in the last 12 years, and the total for 1895, viz., 1,317,878, may be compared with the total of factories on the registers of factory inspectors in 1894, viz., 36,259 employing "youthful workers" and 29,624 employing women. In the meantime, however, no estimate can be given of the full bearing of statements which rest on general observation, to the effect that "the stricter regulations for "factories have here (*i.e.*, in Germany) as elsewhere the fatal result of "increasing the number of small workshops and outworkers,"* an opinion which has been recently emphatically sustained in a discussion in the *Reichstag* on the proposed extension of the factory regulations to small and home industries (January 15, 1896).† The statistics

* Article by Fräulein Dyhrenfurt on German Factory Inspection in the "Women's Trades Union Review," April 1895.

† Soziale Praxis, Jan. 23, 1896.

given in the official reports are already so far more elaborate than any yet attempted in connection with English factory administration that their limitations would hardly have suggested themselves were it not for the particular task laid upon the German inspectors of inquiring into the effects on women's labour of the enforcement of an eleven hours' day.* The attempt to estimate the results bring into the clearest relief the futility of observations made without careful statistical inquiry into the extent of the field for women's labour which remains untouched by the restriction. One cannot find any certain or complete explanation as matters are of the steady increase in numbers of women employed in "factories" while the numbers of young workers are equally steadily declining :—

—	Factories employing Young Persons.	Factories employing Women.	Numbers of Young Persons and Children.	Numbers of Women employed.
1894	36,259	29,624	213,974	633,783
1893	36,100	28,177	219,871	616,545
1892	35,284	24,101	220,174	576,483

In every single group of industries excepting the mining group there is a more or less decided increase in numbers of women employed in "factories," whether in textile, clothing, printing, chemicals, or other industries; in nearly all the industries there is a decline in the numbers of young workers in factories, and this decline is most marked in the textile group, where, as compared with 59,469 young workers (from 13 to 16 years) in 1893, we find 55,280 in 1894.

The decline is attributed by some inspectors to depression in trade, Employment as for example in Düsseldorf. "In the branches of industry where a of children. " decrease in numbers of young workers is to be observed, the cause " must be seen generally in the depressed condition of trade, and only " in individual cases can it be set down to a desire on the part of " employers to avoid the restrictions of the law." On the other hand, a considerable number of inspectors do attribute the decrease observed in the factories to a progressive transference of child labour and labour of young persons in consequence of legislative restrictions to the smaller and particularly the home industries: "There the young people " work, often from early morning till late at night, in low close rooms " mostly used as living rooms. . . In such domestic industries the " hours of young workers are daily 12½, from 8 a.m. till 11 p.m., with " four pauses amounting to 2½ hours, and for school children, daily, " 9 hours, from 1 p.m. till 11 p.m., with two pauses amounting to one " hour (Annaberg)." "The wish is being more often expressed, both " by employers and workers, that the restrictions of the law should be " extended to the smaller undertakings (Aue)."[†]

In 1893 an inquiry was undertaken by the school authorities in Leipzig into the occupations of school children out of school hours with a view to exercising, where desirable, the power they possessed of forbidding the employment of the children for purposes of gain. On the whole, it appeared to the authorities that their employment was free from serious abuse, being mainly of a subsidiary character as

* Jahresberichte der K. Preuss. Gewerberäthe, 1895, p. xxiii.

† Amtliche Mittheilungen, &c., 1895, pp. 52-4.

messengers, milk carriers, and the like, and in one representative school the numbers so employed apparently did not exceed 17 per cent.*

Against this result should be weighed such statistics as those published by ecclesiastical authorities in Berlin, showing that 70 per cent. of youthful offenders undergoing imprisonment had been employed in such subsidiary occupations during their early school years.† The editor of "Die Frau" draws attention, in the January number of 1896, to figures revealing an evil of great proportions in the subsidiary industrial occupation of school children in Berlin, Charlottenburg, Rixdorf, and elsewhere. She points out, however, that "a prohibition " of all child labour in defined cases . . . although urgently needed " . . . may prove but a two-edged sword in the cases where the " children help to support the family. Here individual treatment " must also enter, the sole means of reaching the goal in care of the " poor."‡ Teachers' guilds in various parts of the Empire have passed resolutions condemning the practice of employing children in industries during the years of attendance at elementary schools. In several provincial towns the power of forbidding such employment has been exercised.§ As I have already pointed out, the requirements as to school attendance and standards vary in the different States, and these requirements seem to be most advanced in the Southern States. In Bavaria, the inspector for Upper Franconia reports that an opinion is growing among all industrial classes for an extension of the compulsory attendance at school for children from 13 to 14 years old. It is found that employers do not care to take on young workers until they are permitted to work 10 hours in the factories, and the parents do not know what to do with the children when they are not in a position to look after them at home themselves.||

Education.

No statistics as to the general progress of education in the elementary and continuation schools are available for the Empire owing to the separate state and local control of these matters. I am informed that it is not improbable that the example of Württemberg (*cf. supra*, p. 170), in extending the obligation of attendance at continuation schools, will be followed in other states, and that especially in Prussia the schools themselves will be remodelled and improved. In a recent memorandum on the development of technical and continuation schools under the Ministry of Commerce and Industry, an intention is indicated¶ of filling in the gaps left by the provision in Section 120 of the Industrial Code, which leaves this matter largely under communal control.** At present in Prussia (exclusive of the provinces of West Prussia and Posen) there are 761 technical continuation schools with 100,417 pupils, besides 168 guild schools with 11,674 pupils. An interesting illustration of local attempts to control abuses in child labour may be seen in an order of the Nurnberg magistrate of July 22, 1895, which absolutely prohibits employment of school children in variety theatres, *café chantants*, and the like, and greatly restricts their employment in other directions.††

* Amtliche Mittheilungen, &c., 1895, p. 72.

† Soziale Praxis, July 8, 1895, p. 733.

‡ "Die Frau," January 1896, pp. 241-4.

§ Soziale Praxis, August 26, 1895, p. 920; October 10, 1895.

|| Jahresbericht der Kön. Bayer. Gewerbe Inspectoren, 1895, p. 180.

¶ Denkschrift über die Entwicklung der gewerblichen Fortbildungs Schulen, 1895, &c., January 1896, pp. 57-61.

** Soziale Praxis, August 5, 1895, p. 840.

†† *Ibid.*, p. 840.

In Annaberg a noteworthy step has been taken by the inspector in dealing with abuses in employment of children in industrial establishments not classed as factories; the opinions of medical experts have been taken as to the harmful effects of long hours, and regulations restricting their duration will be enforced by the police authorities under Sections 120c and 120d of the Industrial Code. It is certainly one of the merits of the system of legislation by general principles, as contrasted with the detailed prescriptions of the English laws, that a way is generally left open for dealing promptly, by administrative methods, with special abuses in accordance with the drift of public opinion. On the other hand, in view of the unequal pressure exercised by local administrative authorities, the lack of a direct legislative control of hours of children in industrial establishments generally would appear to be a very serious matter for the future strength of the labour forces of the Empire, apart from all nearer considerations. In the brickfields, where the local authorities have special powers to intervene, abuses in connection with child labour are still very grave. "The condition of "the young workers (in Mülheim), who are generally employed in "carrying the bricks, is very wretched. They are kept on until ready "to drop, and then find only a resting place for the most part not fit "for human beings." Many foreign children are employed with certificates stating their age to be 16, when both the inspector and the medical officer (*Kreisphysikus*) are of opinion that they cannot be older than 13. "The numerous infringements in the brickfields are purposed "by the employers . . . who know that they will be sentenced by "the courts to merely nominal fines."* Socialist publications and the Labour Press may and do draw attention to the limitations of the law, the defects in organisation of administration, and the omissions from inspectors' reports, but there is no need to go beyond the explicit statements of these very reports, full of sound and sympathetic observation as so many of them are, for the fullest justification, if that were needed, of extension and completion of State control of the conditions of industrial life. In the report for Düsseldorf the miserable conditions are shown of the young workers in the domestic workshops (*Haus-industriellen Betrieben*) of the small iron and textile industries in the surrounding districts, "cases were established of the employment of "young workers daily for 15 hours . . . Knife grinders (*Messer-reider*), in addition to their own children, whom they set on from a "very early age, employ apprentices of from 13 to 16 years for periods "beyond all measure; not seldom the apprentices run away . . . "The masters then demand that they shall be brought back by the "police authority, a demand which has been sometimes refused. In "Langenberg many school children are employed in their holidays from "6 a.m. to 9 p.m. . . . All secure legal basis is wanting for "interference by the authorities. The extension by Imperial Decree of "Sections 135 to 139b of the Industrial Code to workshops, which is "to be hoped for soon, will alone afford the required means."†

Turning from the hours of children to the hours of women, abuses Employment are similarly prevalent in the smaller industries, and the "health of the of women. "women appears to be especially endangered in such ill-ventilated, low, "and over-heated workrooms as are found in the small laundries. An "excessive working day is found in those laundries in Kiel which "employ about a dozen women nominally from 12 to 14 hours a day.

* Amtliche Mitteilungen, &c., 1895, p. 81.

† *Ibid.*, p. 53.

" On Saturdays and eves of holidays they have to work as many as four hours' overtime, so that often a total of 85 hours a week is reached or exceeded. In many of these establishments the low and confined ironing rooms are used as drying rooms at the same time, or communicate directly with drying rooms. When to these conditions are superadded the intense heat from the iron stoves, the absence of ventilation and closed windows (on account of smuts), no doubt remains that the long hours are most serious from a hygienic standpoint, as may be further proved by the sick statistics (*cf. also supra*, " p. 166). In consequence of these observations the employers were ordered, through the police authorities (under Sections 120d to 120b), either to reduce the hours to 11 a day, and to exhibit a notice in the workrooms stating the beginning and close of the period, or to provide at least 7 c.b.m. for each person, to separate the drying rooms completely from the workrooms, and to take measures to carry off "vapours as they arise." With reference to an alleged irregularity of conduct amongst washers and ironers, and the statements of employers that this increased with increase of leisure, the inspector adds that his experience shows that nowhere does the conduct of workwomen leave more to be desired than amongst those who have the longest hours.*

Several inspectors point to the difficulties experienced by occupiers of factories in competing against the long hours maintained in small industrial workshops, and an increasing tendency is observed to carry work home at the end of the day, with most unfortunate results to the workwomen in health and working capacity. "This evil can unfortunately neither be dealt with under Section 137 of the Industrial Code, nor can the employers yet be influenced to check it themselves."† "A straw-hat worker, who had formerly worked at home, but was now employed in a factory, expressed a wish, when in conference with the inspector, and in the name of her fellow workers, that all domestic industries should come under inspection," and the inspector agreed that this was an end to be aimed at "so far as it is impossible to put "an end to domestic industries altogether."‡

With regard to legal overtime of workwomen over 16 years it is satisfactory to note that the tendency is towards a very decided reduction of the same, measured by statistics as to permits granted by the various authorities. A decrease is shown on every point, whether numbers of factories to whom permits were granted, of total hours worked, or numbers of women affected. More particularly the decrease is observable in connection with the exception applying to subsidiary work on Saturday afternoons. In the clothing trade the figures show that not more than 218 factories worked legal overtime in the Empire during 1894, that not more than 15,769 women were concerned, and that the total number of hours' overtime was 261,213 as compared with 348,518 in 1893. Eleven applications were refused to clothing manufacturers. These figures do not include the Saturday afternoon permits which were granted in 42 factories. As may already have been seen these figures shrink in their significance when the vast number of establishments outside the scope of the restriction as to hours is considered. The figures for the textile industries have a far greater significance, for there, if anywhere, the eleven hours' day might be supposed to be a reality. In spite of the fact that 125 applications were refused in 1894, as compared with 56 refusals

* *Amtliche Mitteilungen, &c.*, 1895, pp. 204-5.

† *Ibid.*, p. 107.

‡ *Ibid.*, 1894, p. 204.

in 1893, legal overtime was worked in 1,379 textile factories as compared with 891 in 1893; the total number of women affected was 129,997* as against 89,168 in the previous year, and the total number of hours worked was 2,109,300 as compared with 1,845,526 in the previous year. The total number of hours' overtime recorded for every industry in the German Empire in 1894 was 3,557,946. In Prussia alone the total fell from 1,738,723 in 1893 to 1,049,895 in 1894, and there the applications refused were 107 in 1894 as compared with 79 in 1893. Illegal overtime was found in textile factories in a very considerable number of cases affecting some hundreds of factories, but the total number of convictions for infringements, including illegal employment of women in textile factories, did not exceed 73. "There can be 'no talk as yet,'" writes the Strasburg inspector, "of a complete enforcement of Section 137. . . . It strikes one curiously to hear complaints of the injurious effects of the application of the law from the lips of the very employers whose . . . workwomen have been found working 12 and 13 hours, and taking their meals, even the mid-day one, standing at the machinery still in motion."† On the whole, however, it is undoubtedly in the textile industries that the largest number of women have actually been affected by the restrictions as to hours inaugurated by the amending law of 1891, and it is with the greatest interest consequently that one reads the figures given by the inspector for Lower Alsace in support of his statement that "under the influence of Section 137 the number of women employed in the textile industry has increased both absolutely and relatively." A similar result is found in the Düsseldorf district. Improved organisation of work, adoption of better methods, and an increased output per worker, appear to be the most important immediate results of the restrictions.‡

Taking nine chief groups of industries in the order of the numerical strength of women employed in them (over 16 years of age) it will be seen that the tendency is, in all, for their numbers to increase, and this in the factories under regulation:—

—	1893.	1894.
I. Textile Group - - -	305,175	310,691
II. Food Preparing - - -	84,876	88,785
III. Clothing - - -	50,303	51,901
IV. Paper and Leather - - -	39,420	41,027
V. Stone and Earth - - -	34,294	35,377
VI. Metal-working - - -	28,753	30,517
VII. Printing - - -	16,247	16,564
VIII. Wood Industries - - -	12,652	14,007
IX. Chemicals - - -	10,661	11,033

Only women employed about mines and salt works have decreased in numbers.

In view of recent discussions in England of the desirability of further restricting the employment of child-bearing women in workshops and factories, it seems important to summarise the results of the provision in Germany, which requires women to produce a medical certificate of fitness if they desire to recommence work in factories at the end of four

* To these might be added 8,900 who were employed in subsidiary work on Saturday afternoons, but the hours are not clearly given for those exceptions.

† Cf. Soziale Praxis, Sept. 23, 1895, p. 1,020.

‡ The same cf. Amtliche Mittheilungen, &c., 1895, pp. 127, 139, and ff.

weeks after their confinement, or otherwise to remain six weeks absent from work in the factory. The official summary points to the fact that by far the greater number of the inspectors have found that the restriction has been observed without trouble or apparent injury to anyone. In this case, as in the case of overtime, however, any conclusions would be hasty which failed to take account of the fact that the restriction does not apply to the great majority of workshops. Hence a special significance attaches to the following remarks of the inspector for Lower Franconia : "It is to be regretted that many communal sick funds afford either no support or too small a support to women at their confinement. The women are thus compelled at the earliest moment possible to go into a workshop, or to undertake rough charing work, or to become outworkers for the factories, thus further depreciating the condition of home industries. To these tendencies must be added a further tendency to dispense with the services of women approaching confinement, and it will be seen that the lot of women has not been rendered lighter."

In Neumünster the association of employers has decided since 1892 to refuse employment to any woman earlier than six weeks after confinement, in order to avoid risk of infringing the Code, "a decision which presses very hardly on many," in the observation of the inspector. The same view seems to be forced upon the inspector for Schleswig, who finds that the most favourable provision of the sick funds does not extend further than a support for four weeks. Throughout the enumeration of difficulties the assumption appears to be that the woman is destitute of support unless provided for in a sick fund, if she is excluded from self-support. One of the inspectors for Saxony reports that the restriction in question can hardly be thoroughly controlled. "Those whom it concerns go after their confinement into another factory, where a question on this subject is not asked, and for obvious reasons is not likely to be asked." In connection with the subject of special insurance for child-bearing women it seems important to draw attention to the remarks of the inspector for Freiberg, who shows that the claims of women during confinement on a local sick fund amounted to 283 marks in 1893 (for 22 women), and to 524 marks in 1894 (for 34 women), although the total number of women employed was less by 15.* The evidence in Germany certainly tends to show that this difficult question can hardly be satisfactorily dealt with by a simple prohibition. Legislation to attain the end in view must probably go further, and must also be based on some explicit reference to the wishes and opinions of the persons concerned. The Austrian inspectors expressly state that mere prohibition is useless without a further system of registration.

The general conclusion to be drawn from the inspectors' reports with regard to the legal claim of women in charge of a household to an extra pause of half-an-hour at mid-day is, that except where special conditions of manufacture render such a practice easy, and where the employer is really wishful to conform to the spirit of the Code, the provision remains and must remain something of a dead letter. "In fact, in numerous cases no claim has been put forward by the workwomen through fear that their services may be dispensed with, or through fear of otherwise unfavourably affecting their position. The attitude of employers towards the provision is most varied; many have granted the longer pause to their workwomen readily, while others have looked upon it as oppressive and vexatious, and indeed absolutely impracticable for certain undertakings."

* Amtliche Mittheilungen, &c., 1895, pp. 124-27.

7.—*The Truck System. Fines and Deductions. Workmen's Committees.*

In Prussia, in accordance with the ministerial circular already referred to (*cf.*, p. 142), the enforcement of the provisions against the truck system (Sections 115 to 119a, R.G.O.) is under the supervision of the industrial councillors and inspectors. As indicated, the methods of administration are imitated in other states, notably in Bavaria, Württemberg, and Saxony.

The provisions against truck apply to every industry coming within the scope of the Industrial Code; outworkers providing their own materials are included as well as workers employed on the employers' own premises (Section 119b); the term employer (*Gewerbetreibender*) includes an employer's agent and representatives, whether members of his own family or not (Section 119). It is of no consequence whether the employer is to be regarded as a manufacturer (*Fabrikant*), a small employer (*Kleingewerbetreibender*), or a merchant (*Kaufmann*)*; all are either directly, or through their agents or sub-contractors, "bound to calculate and pay the wages of their workers in current coin of the realm" (Section 115). They may not credit their workers with goods. Nevertheless it is permitted for them to provide their workers with food at cost price, with house room and use of land at the local market rate, with fuel, light, regular board, medicines, and medical treatment, tools and materials for work at the ordinary rates,† reckoned in with the wages. Provision of tools and materials for piecework (*Akkordarbeiten*) is permissible at a higher rate if so agreed beforehand, and if the rate is not above the local and customary rate (Section 115).

"Wages and payments on account must not be paid in public-houses nor in shops without authorisation from the administrative authority. . . (Section 115a).

"Workers whose claims have been settled in any way contrary to Section 115 can demand a full settlement at any time, and no counter-claim for amounts irregularly paid can be set up. The latter sum, if still in the hands of the receiver, is the property of the provident fund to which the worker belongs; or, if such does not exist, to some other local institution for the benefit of the workers . . . or to the local poor funds (Section 116).

"Contracts contrary to Section 115 are void. The same holds good of agreements as between an employer and his workers, that the latter shall purchase any of their necessaries at any particular place, or that they shall apply their earnings to any other purpose than such a one as may improve the position of the worker or his family" (Section 117).

No claims can be set up on account of goods supplied contrary to Section 115 (Section 118).

"Retentions of wages by the employer to insure himself against loss by illegal breaking of contract on the part of worker . . . may not exceed one-fourth of the wages to be paid at any given time, nor amount to more on the whole than an entire week's wage."

Local bye-laws may determine the periods for payment of wages, but these periods may not be shorter than one week nor longer than one month. Such bye-laws may also provide that the wages of minors shall be paid to parents or guardians, and prohibit payment to minors except after a written request from a parent or guardian that the wage shall be paid to the minor (Section 119a).

* Reichs Gewerbe-Ordnung, Berger and Wilhelmi, 1895, p. 202.

† "Durchschnittlichen Selbstkosten." This covers not only cost of production but also such additional expenses as arise through storing and the like.

(b) re Fines.

Fines and deductions from wages are prohibited as illegal in factories unless expressly provided for in the authorised working rules, a provision the value of which is so striking that it seems extremely regrettable that it has not as wide a scope as the provisions against truck. The maximum amount of the fines, the mode of determining their amount and of exacting payment, and the object to which the fines are applied must be stated in the working rules. No fine may exceed a maximum equal to half a day's wage of the person fined, except in the cases of offences against fellow-workers, serious offences against propriety of conduct, or against regulations necessary for the safety of the workers; in these cases the fines may amount to a full day's wage. All fines must be devoted to some institution for the benefit of the workers in the factory; the right of the employer to recover damages in the ordinary way are not touched by this provision. A notice in the prescribed form, open at all times to inspection, must show all levies of fines with the name of the person fined, the date, the offence, and the amount of the fine (Sections 134b to 134c). Opportunity must be given to all workers of full age in the factory to express an opinion on the disciplinary and other regulations contained in the

(c) re Workmens Committees.

working rules. If a permanent workman's committee has been formed it is sufficient to invite the opinion of this committee. If such a committee consents, regulations may be laid down in the working rules for the guidance of workers in connection with all arrangements made in the factory for their benefit and use (Sections 134b and 134d).

Only the following may be regarded as permanent workmen's committees:—

1. The committee or directing board of any factory, sick fund, or other permanent fund whose members have been duly elected by the whole body of workers in the factory.
2. In the cases of miners not under the Mining Law the Miners' Friendly Societies (*Knappschaftsvereinen*).
3. Any representative group elected by ballot by the workers of full age among their own ranks, whether for separate divisions of the work or for the whole body of workers (Section 134b).

These various important provisions, which it has appeared convenient to present here together on account of the possible development of a close connection between them, were all either first enacted or received important modifications through the amending Act (*Gewerbe Novelle*) of 1891.

II. Inspectors reports:

(a) On truck.

The provisions against truck appear by the inspectors' reports to have become operative in some parts of the empire in a way not yet to be hoped for in the case of provisions as to disciplinary fines and workmen's committees. Although the reports as to legal and regular payment of wages are, however, favourable in several important districts of Prussia and Saxony and in Hesse and Anhalt, yet infringements are shown as occurring in many directions, and some of the worst cases appear in connection with quarries and brickfields. In the Pfalz district, for instance, it was found that some stone quarrymen were compelled to purchase beer at a particular public-house, and payments were made through the employer. In Upper Franconia, in a brickfield, the workers were supplied with beer during pauses at 22 Pfennige the litre, a price exceeding the cost of production. A prosecution of an employer in one of the Württemberg districts for payment of his workers in store tickets recognised at a particular store, led to a conviction and penalty of three marks; it was shown in court that the employer had no profit out of the transaction and was ignorant that he was breaking

the law. The Baden report brings forward a case, which was followed by a conviction and 90 marks penalty, as an illustration of the alleged fact that infringements of the provisions against truck are now chiefly formal. An owner of a large weaving shed and some of his managers had supplied workers for over 25 years with remnants on credit at a very low rate by weight. "There was in the transaction no question of a "profit for the employer, only an advantage for the worker."*

It was found by the inspector in Breslau that a provision had been made in the working rules of a saw mill that debts incurred by workers at the village public-house should be deducted from their wages. The factory inspector for Munich draws attention to infringements of the truck provisions occurring in Bavaria, especially in connection with supply of food and drink to workers, and states that these matters will in future receive more attention from the inspectors than has been possible hitherto.† "In two cases," writes the inspector in Würzberg, it was found that "the claims of creditors on wages were being admitted "in a more or less direct way. Threats of dismissal form the chief "indirect means of effecting settlements of the claims of creditors on "wages. . . . In two other cases it was found that deductions from "wages on account of sick insurance had exceeded the statutory limits, "and in one factory that the deductions had been made and not entered "in the sick insurance fund. Proceedings‡ were taken through the "district police authority and penalties inflicted.

Very varied modes of dealing with the provisions as to fines by (b) On Fines. employers are reported on by the inspectors, and although in an increasing number of cases systems of fining for discipline are being given up as unsatisfactory and undesirable, still the careful provisions of the Code are a long way from being fully operative, and many employers exact or permit the exaction by their officials of excessive and illegal fines.

From Zwickau the inspector reports: "Perusal of the prescribed fine lists showed that the amount of the fines was usually regulated by foremen and overlookers, a matter which is properly the concern of the owner or manager. This practice leads to variations in the amounts of fines for one and the same species of offence." From Frankfort-on-the-Oder, it is reported that "the long lists of fines show a want of correspondence with the scope laid down for them in the working rules. A single factory may be taken as an example, where in two years . . . 370 fines were levied on an average number of 190 workers employed. . . . Not seldom fines are levied which either directly infringe Section 134c of the Industrial Code or have no basis in the working rules; the maximum limits of the fines are often enough exceeded, especially in the case of young workers."§

Honourable exceptions have special stress laid upon them. "Employers here and there have given up such forms of discipline, and some working rules contain excellent provisions, of which the following may serve as example:—'Fines will not be admitted in the meantime. I rely upon the sense of honour . . . of my workers to obviate the need for fines, and that in case of exceptions a reminder from a superior officer (*Vorgesetzten*) will be sufficient. . . . Repeated serious infringements of the working rules will be dealt with by myself and

* Amtliche Mitteilungen, &c. . . . 1895, p. 250.

† Jahresberichte der K. Bayrischen Fabriken Gewerbe Inspectoren, 1895, p. xxv.

‡ *Ibid.*, pp. 287-8

§ Amtliche Mitteilungen, &c., 1895, pp. 258-60.

" 'will render offenders liable to dismissal.' " In many districts it has been frequently found that although fines are provided for in the working rules, they are not enforced, as the employers find relations better between the workers and themselves without them. In Lower Franconia, fines ranged generally in amount from 5 pf. to 50 pf. ($\frac{1}{2}$ d. to 5d.). In Altenburg out of 166 large factories fines had only been enforced in 35, affecting 2,970 workers; the total sum reached 1,406 marks, or an average of 40 pf. per worker.

Deductions from weavers' wages for flaws in cloth were inquired into by the Potsdam inspector, and he states that he found that the average rate of fines in the factory where the highest fines are inflicted for this cause amounted to no more than 60 pf. (6d.) per loom in the year. The fines he states in no case took the form of compensation to the employer for loss, and were only levied after a certain number of flaws had been passed, and as a kind of "stimulus to greater attention on the part of the weaver." *

"The expenditure of sums raised in fines frequently gave rise to special inquiry, either because clear indications were wanting in the rules or were irregularly provided for, or because no application of the money had been made."

"In a factory where 45 workers were employed the sums raised by fines amounted to 200 marks. In accordance with the working rules sick or needy workers were to receive aid from this fund; no occasion for this assistance had arisen for a long time."

(c) On Workmen's Committees.

In Dortmund employers have often expressed a difficulty as to the best mode of applying the proceeds of fines, "thus giving good opportunities to the inspector to successfully recommend the formation of an authorised factory committee." The institution of this admirably devised method for introducing an element of self-government among factory workers and so improving their relations with employers has, unfortunately, only progressed very slowly. As the inspector for Schleswig writes, employers have only too widely neglected to take up that initiative which was planned for them by the legislator. "Few can persuade themselves to take counsel with workmen's committees on broad or far-reaching measures for the economic welfare of their workers.†

Where the committees have been formed, and this appears to be more frequently the case in the South and West of Germany, their sphere is generally confined to definite matters such as institution and application of fines, settlement of differences between workers, expression of opinion upon and enforcement of the working rules. Some fine examples of a wider scope of activity for these committees justifies the embodiment of the conception in law. The inspector for Döbeln cites from a factory in his district the following enumeration of duties as a good model of the work that may be successfully undertaken: "(1) Maintenance of the working rules jointly drawn up by the employer and the committee, enforcement of accident insurance regulations and of all other rules in the interest of the workers and the honour and good organisation of the establishment; (2) Development and control of all benevolent institutions for the benefit of the workers in the factory; (3) Discussion with the employer of any new schemes for the improvement of the establishment and well-being of the workers; (4) Supervision of the young workers in the interests of order and good habits; (5)

* Jahresberichte der K. Preuss. Gewerberäthe &c., 1895, p. 52.

† *Ibid*, 1895, p. 255.

" Pronouncing of decisions in questions laid before them by the employer ; (6) Action as a court of first inquiry in case of disputes between workers ; (7) Warning, fining, or recommending dismissal of workers who show disregard for the honour, propriety, and peace of the factory." A very successful workman's committee formed in the Imperial Torpedo works at Friedrichsort has functions similar to these just recited. It is composed of ten members elected by ballot by all workers over 20 years who have been in the works not less than three months. Those are eligible for election who are over 24 years and have worked not less than a year. The chairman is elected by the committee among its own members, but if the director of the works attends committee meeting he is *ex officio* chairman. Meetings take place at least once a month.

In Lower Bavaria workmen's committees were provided for in 20·2 per cent. of the copies of rules sent in for authorisation during the year. In Württemberg and Hesse the formation of these committees appears to make progress. In one case it is interesting to observe that length of hours has been regulated by a committee, whose advice is taken as to the need for occasional overtime or the setting on of extra workers.

8. Legal Proceedings and Sanctions of the Code.

By Section 146 the following offences may be met by a fine of not more than 2,000 marks (100*L.*), or imprisonment of not more than six months :—

1. Infringement of the provisions against truck (*c.f.* Section 115).
2. Illegal employment of women, young persons, or children in "factories," whether contrary to the direct provision of the Code (Sections 135, 136, 137) or special provisions laid down by the Federal Council (Sections 139, 139a).
3. Infringement of the provisions relating to contract-books and certificates of work.

By Section 146a infringement of the prohibitions as to employment of industrial workers on Sundays and holidays may be met by a fine of not more than 600 marks (30*L.*) or by imprisonment.

By Section 147 the following offences may be met by a fine of not more than 300 marks (15*L.*) or imprisonment.

1. Infringement of the provisions against carrying on, or extending or altering the premises in which are carried on, any of the dangerous occupations named in Section 16 for which special authorisation is necessary.
2. Infringement of any of the regulations which are made the condition of the grant of the special authorisation.
3. Infringement of any of the orders made by the local authorities with regard to conditions of health in any individual workplaces (Section 120d), or infringement of the special orders for branches of industry laid down by the Federal Council (Sections 120d and 120e).
4. Failure to affix copies of the working rules or to acquaint the authorities with alterations in the working rules.

By Section 148 the following offences may be met by a fine not exceeding 150 marks or imprisonment for four weeks :—

1. Commencement of an industrial undertaking without prescribed notice to the authorities.

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9. Failure by an employer to fulfil his legal duties to his apprentices.
11. Enforcement of disciplinary measures against his workers by an employer contrary to the "working rules," or application of disciplinary fines to other than the approved purposes.

By Section 150 the following offences may be met by a fine not exceeding 20 marks or imprisonment for three days:—

1. Employment of minors in industrial undertakings where the employer has been deprived of this right (Section 106) or without the prescribed contract-book (*Arbeitsbuch*).

* * * * *

4. Refusal by employers to comply with local or State regulations for attendance of minors at continuation schools.

5. Failure to affix prescribed particulars as to fines in a factory.

By Section 149 an employer is liable to a fine of 30 marks, or eight days' imprisonment, for obstruction of an inspector in the execution of his duty; for failure to give prescribed notice of employment of protected persons; for exceptional employment of workers on half-holidays or holidays without affixing prescribed particulars, for failure to supply workers with an authorised copy of working rules.

The penalty incurred by an employer who puts an obstacle in the way of inspection by any of the authorised officials by night or day, or who withholds required information from the same (Section 139b), stands in striking contrast to the penalty for illegal employment of protected persons. Taken alone it would seem to offer a premium to obstruction in the case of employers disposed to employ women or children illegally. It is important therefore to draw attention to the fact that all the powers of the police, which are extensive, can be applied in such cases, and to illustrate this by a decision of the Penal Court (*Strafkammer*) of the *Landgericht* in the Trêves district. A miller who had refused admission to an inspector, accompanying his refusal with threats, and whose workplace had to be visited in company with a gendarme, was sentenced to 17 days' imprisonment, a sentence which is expected to have a satisfactory effect in the district.* No complete statistics of offences of this character are given in the reports, but two other cases of obstruction are incidentally reported on as occurring in the Berlin district. Cases of rudeness and opposition of employers to inquiry by the officials are mentioned by the inspectors for Annaberg and Magdeburg, and complaints made by employers at Erfurt as to the multiplication of visits by various kinds of officials are reported, but on the whole the industrial councillors and inspectors are agreed that the relations between employers and inspectors are satisfactory. "Although the requirements of the inspectors (*Gewerbeauf-sichtsbeamten*) are occasionally only carried into effect after repeated notices and reminders, yet they are invariably attended to in the end. "Official compulsion has only to be resorted to in exceptional cases."†

In smaller cases the fines may be levied by the police authorities, without taking proceedings before a court, and frequently the offender consents to this method as it saves him costs. His appeal can always be made, however, as already stated, either to a higher administrative authority or to a judicial court. If an offence has been committed by a person or persons placed in charge of his work by an employer the actual offender is liable to the penalty. "The employer is held jointly responsible with the offender if the infringement occurred with his fore-

* *Amtliche Mitteilungen, &c., 1895, p. 37.*

† *Ibid., 1895, p. 36-7.*

" knowledge, or if it appears that he had not exercised due care in choosing or controlling his agents." (Section 151.)

The industrial councillors and inspectors in some important districts report for 1894 a great increase in the activity of the police authorities in revising and enforcing regulations in all kinds of industrial establishments. Special visits made on behalf of protected persons in Berlin numbered 99,408 (of which 504 were at night) in the course of the year. The smaller workplaces, not coming under the description of "factory," in Dresden and neighbouring towns, are being actively inspected by the police authorities, and closer communication with the inspectors has been organised. In Alsace Lorraine the district president (*Bezirkspräsident*) is enforcing the regulation that industrial establishments shall be revised twice a year by the local authorities, and their reports are forwarded to the inspector who returns them with comments, and in this way a considerable advance has been made in repressing illegalities and advancing joint action between the double sets of authorities.

On the whole, however, the administration of the Code by the local authorities is a very uncertain and unequal one, and in many smaller towns and country districts is practically non-existent. In some cases where revision of the workplaces is undertaken infringements are overlooked or even expressly permitted through ignorance on the part of the police officials. "The revising activity of the local police authorities in country districts (in Swabia) was still less satisfactory than in the preceding year, for, in many communes, elections had led to a change in local boards (*Ortsvorstände*). It cannot be wondered at that the initiative of the local authorities . . . is often weak; in many cases the officers are wanting in understanding or knowledge of the provisions they ought to enforce, in others they are absorbed in fulfilment of other services (Württemberg)." This experience is almost verbally repeated in 14 other important districts. In many country places the inspectors take pains to instruct the chief officials in the communes, *e.g.*, the burgomaster, as to the requirements of the Code, in other places they take up the revising work of the local authorities in addition to their own. "In one commune (Lower Alsace) the burgomaster was of opinion that enforcement of the Code would lead to awkward conflicts between the factory owners and the commune."

"A great many of the manufacturers feel themselves mortified by visits from the under police officials. . . . They have sent pressing petitions against them to the factory inspectors; the inspectors are the more inclined to pay attention to these petitions in that they find their own orders and advice receive the greater attention while they themselves are received as expert advisers."

In view of such evidence it is not surprising to find some manifestations of public opinion in favour of a reform of the administration of the Code which shall put more direct executive power into the hands of the inspectors. Of the existing dissatisfaction some illustration may be seen in a recent debate on reform of industrial inspection in the Württemberg Chamber of Representatives.* The question is not one to be so lightly solved as has been suggested, nor can it very well be compared with English problems turning on the relation of central to local control of sanitary matters in workshop and factory administration. As is expressly recognised by the article of the Code on "supervision" (*Aufsicht*, Section 139*h*), much turns on the constitutions of the separate

* Cf. also Soziale Praxis IV. Jahressang. Nummer 51, article Arbeiter Schutz und Gewerbe Inspectoren, p. 996.

States, and no changes can be satisfactory which are not built in some degree on the spirit of those individual constitutions.

The tables appended to the volumes of annual official extracts from reports of the inspectors, show in an interesting way the proportion of convictions to the number of "factories" in which infringements affecting particularly protected persons were found. During 1894, for the whole kingdom of Prussia, 333 convictions were obtained, of which 234 turned on infringements affecting young workers. In 4,185 factories infringements had been found affecting young workers, and in 1,773 factories infringements had been found affecting women; in many of these cases the infringements had been manifold. Statistics are incomplete for Prussia in 1893. In Bavaria in 1894 there were altogether 1,459 factories in which infringements against protected persons were found and 34 convictions, but this is a higher proportion of convictions than in the previous year when there were 1,736 irregular factories and 19 convictions. For the whole German Empire in 1894 the proportion was 11,002 irregular factories and 756 convictions.

9.—Note on the Relations between Workers and Inspectors.

Serious efforts have been made by inspectors in various parts of the Empire within the last year or two to overcome the strong reluctance shown by the workers to approach them with their complaints or information as to infringements of the law. The majority of the inspectors have frequently reported on the difficulty of establishing any firm or open counsel between themselves and the workers, and have explained it in various ways, of which the most interesting has been already quoted above in connection with boiler inspection (p. 144), but only recently have organised practical efforts been made to remove the difficulty, and these efforts seem worthy of some attention. As the inspector for Baden explains it, the whole difficulty arises out of "the "dread of being dismissed or otherwise drilled by the employer if "recourse is had to the counsels of the inspector." The difficulty is, of course, enhanced wherever organisation of the workers is lacking or weak, especially in a country where, according to its own thinkers, the workmen have an acquired tendency to submission and dependence on authority (*cf. supra*, p. 159), and "there may well be no lack of moral "courage in workers who carefully weigh the chances of losing the "means of subsistence of their family as against the possible resultant "gain of formulating a single complaint to the inspector."

One example of loss is enough "to confirm a secret opinion that the "State is hardly strong enough to sufficiently enforce the claims" which it theoretically maintains.*

Some of the inspectors give statistics as to the nature and results of complaints addressed to them, which show that a considerable proportion of the grievances are, as for example in the case of truck, unjust fines and deductions, of such a nature that investigation is impossible without explicit reference to the individuals concerned. In the Breslau district, where a considerable number of the complaints referred to unhealthy or dangerous conditions, satisfactory action could be taken by the inspector, who states that "in almost every case the complaint was well-founded."

The foremost method now adopted by the inspectors with the workers is the appointment of regular consultation hours (*Sprech-Stunden*) at

* *Amtliche Mitteilungen, &c., 1895, p. 38.*

times when it is most convenient for the workers to attend, and in Berlin, Magdeburg, Hanover, Lower Bavaria, Anhalt, Reuss, and many other most important districts, some success has attended the experiment. A difficulty arises in making the announcement sufficiently widely spread. In some cases it appears only in official publications, in other cases the ordinary daily press has been used. As the inspector for Potsdam points out, however, a hindrance to the latter method may be seen in a strong tendency of the non-socialist political press to close its columns to all references to labour questions, except such as present the point of view of employers, and to keep a conspiracy of silence on the work of the inspectors, except when there are alleged encroachments on the part of one of them (*Angebliche Übergriffe*). In some cases announcements have been made by the inspectors of their consultation hours in the labour and social democratic press. Success can only be expected, in the opinion of one of the inspectors for Berlin, when it becomes generally recognised that all parties are alike to the non-political institution of factory inspection. "To forward this conclusion, " support will still be needed from administrative authorities and the " daily press, wherever trade organisation of the workers of whatever " character—socialist, religious, or purely economic—is not present." The occasional unwillingness of authorities (even where established on account of the workers) to further efforts of the inspectors in the direction indicated may be seen in the opinion of the industrial court of Siegen (Arnsberg district), cited by the inspector, that consultation hours for the workers were neither necessary nor desirable; in this case, in spite of the opposed view of the majority of the members of the industrial court, the inspector established his aim, and arranged to see the workers on every first and third Sunday of the month. In another case an inspector affixed a notice in the workrooms of his consultation hours, and, in Coblenz, the inspector stamped his letters and postcards with a notice of the hours, in addition to an announcement in four daily papers. In Düsseldorf, notices have been sent to the Hirsch-Dunker Trade Unions, in Swabia to the socialist organisations, in Nürnberg to the Workmen's Secretary (*Arbeiter Sekretariat*), and in many districts communications have been entered into with various trade organisations and complaint committees (*Beschwerde-Kommissionen*) of the workmen.

One pleasant result of communications between workers and inspectors is specially referred to in various reports. It has been found that where complaints have been pronounced by the inspector after investigation, to be insufficiently grounded or outside the scope of his powers that his decision has been loyally accepted by the workers. The evidence all goes to show that much dissatisfaction as well as many real causes of grievance can be happily removed by development of personal relations between the officials and the workers individually or collectively.

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AUSTRIAN EMPIRE. PROTECTION OF LABOUR IN INDUSTRY.

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(1) Weigelsperg Compendium über Gewerbebewesen, Wien, 1895; (2) Bericht der K.K. Gewerbe Inspectoren, Wien, 1889-95; (3) Soziale Praxis, 1895; (4) Hygiène et Sécurité des Travailleurs dans les Ateliers Industriels, Paris, 1895; (5) Bulletin de l'Inspection du Travail, 1895; (6) Royal Commission on Labour, Foreign Reports, vol. xi., 1893; (7) Report of the Berlin Conference; (8) Handwörterbuch der Staatswissenschaften, Lexis and Conrad, 6 vols., 1890-94.

1. Scope of the Laws.

The basis of labour legislation in Austria* is the Industrial Code of December 20th, 1859, modified in different important aspects by the amending laws of March 15th, 1883 (relating to guilds chiefly), and of March 8th, 1885 (relating chiefly to hours of labour and apprenticeship). As in the case of Germany, a long series of laws and administrative orders affecting the conditions of the workers in industrial undertakings, directly or indirectly, have followed in the train of the Industrial Code, but Austria possesses two important laws affecting factories and workshops not yet embodied in the Industrial Code, viz., the law relating to inspection and the law relating to Sunday labour.

In spite of far more marked divisions of the Empire than in Germany, by internal differences of race and language, it has been found possible to codify not only its commercial but also its civil law; further, Austria possesses laws for formation of industrial courts, and for sick and accident insurance, with interesting variations on the German scheme, in the case of the latter, as to financial basis and administration. The benefits of the Industrial Code are not extended to casual day labourers, to persons employed in "home industries," nor to miners, navvies, fishermen, and agricultural labourers; but, with a somewhat similar scope, in the kinds of industrial workers affected, to that of the German code, the Austrian code has in some ways a simpler, more even and definite method of applying its benefits to those workers who are included. This appears when it is stated that in factories, as distinct

* The Cis-Leithan half of the Austro-Hungarian Empire only. No attempt is here made to deal with the distinct and interesting labour laws of the kingdom of Hungary which have received more recent additions and modifications than the Austrian Industrial Code. It should be noted, however, that a scheme for an amending law has been prepared by the Government with important modifications of this Code, and is now before the country. See Soziale Praxis, March 19, 1896.

from workshops, men share with women the benefits of a limitation of hours and that there is a far closer approximation of the protection afforded to women and children in workshops and factories respectively than in Germany (*see below, pp. 207-8*). Indeed, it may be here remarked that in the first principles of the protection afforded to children as industrial workers, Austria is decidedly in advance of other European countries. Another point which specially distinguishes Austria is that whereas overtime employment is permitted under regulation, it is particularly laid down that such overtime shall be paid for, and this applies to workers of both sexes and all ages. It certainly seems to be a logical consequence of the principle of protection as to hours that where the regulations are relaxed, it should not be without due care that any accruing benefit to the employer should be shared by the employed.

The distinction between large industries carried on in factories and small or handicraft industries (*Handwerksmässige Gewerbe*) is at once more important and more definitely laid down than in German law. The importance of the distinction appears when it is realised that more special jurisdiction and economic support are provided for in Austria in the case of small employers, with a view to strengthening them in their competition with large manufacturers.

All industries fall under one of three classes: (a) Free; (b) Handicraft; (c) Subject to concession. The exact extension of the term handicraft is ultimately decided by order of the Ministers of Commerce and the Interior, who have drawn up a list, but, generally speaking, it applies wherever a manufacturing process is carried on "which requires skilled training, and for which this training is sufficient" (G.O., Section 1);* handicrafts are compulsorily organised and carried on under jurisdiction of the guild system. Those industries are classed as subject to concession (*concessionirte*) which on public grounds require a special authorisation (*Bewilligung*). All other industries are technically "free." This division of industries is not so important, from the point of view of the protection of workers, as one, to be presently referred to, between industries subject to approbation (*Genehmigung*) and those which are not, but it should be noted that a manufacturing process carried on in a factory may be either "free," or subject to concession; while even in the former case the occupier is bound to send notice to the industrial authority before commencing his manufacture, (G.O., Sections 1-15).

Those industries are to be regarded as domestic (*Hausindustrien*), and therefore outside the scope of the code, which are carried on by persons in their own dwellings, whether as chief or subsidiary occupations, without the assistance of ordinary industrial workers (*Gewerbliche Hilfsarbeiter*) and only aided by members of the household (Ministerial Order of September 16, 1883).

The limits of the application of the term "factory" were laid down in a ministerial order of July 18, 1883, and were accepted as so defined by the amending law of 1885. "Those industries are to be held as "carried on in factories (*als fabrikmässig*) in which a manufacturing "process is effected within enclosed workplaces by the aid of not less "than twenty workers, on an average, working with machines, under "the principle of sub-division of labour, and controlled by an employer "who does not himself render manual assistance in the work."[†] It thus appears that the term "factory" approximates a little more nearly to

* G.O. = *Gewerbe Ordnung* = Industrial Code throughout this summary.

† Weigelsberg, *Compendium über Gewerbewesen*, p. 20.

the English conception in Austria than Germany, although it definitely includes some establishments here classed as workshops, and excludes others here admitted as factories. The basis of the division appears as half economic, half social, but to be fully appreciated account must be taken of many conditions unknown in this country (*e.g.* compulsory organisation of employers and workers in small trades). At the same time, the principle on which the English definition is based re-appears in the provision which requires a special approbation or authorisation (*Genehmigung*) for all industrial establishments where machinery is driven by power or furnaces are necessary (G.O., Section 25). It should be remarked that the class of industries subject to concession is not parallel to the dangerous and unhealthy occupations enumerated in Section 16 of the German Code, and must be distinguished from such industries, which, under the Austrian Code also are subject to special approbation (*Genehmigung*). There are 25 classes of industry for which a concession is necessary as against 52 classes of dangerous industries, subject to special regulation on grounds of public health, in addition to the power-driven industries. For a complete list of the former reference should be made to Section 15 of the Austrian Code, and a comparison of the two lists will show that some industries appear in both classes. It is sufficient here to cite the following processes and establishments as thus doubly controlled by the State: Manufacture of fire-works and other explosives; flaying houses; manufacture of steam boilers. The list of dangerous occupations is given under a subsequent heading (G.O., Section 27, *see below*, p. 203).

The persons protected by the Industrial Code in one sense or another as "industrial workers," are the following:—(a) Assistants of every kind in industry, including commercial assistants (*Handlungshelfen*) drivers, waggoneers, &c.; (b) Factory workers, *i.e.*, those actually engaged in manufacturing processes; (c) Apprentices; (d) Workers who are employed in subsidiary processes. Special or superior assistants, such as managers, factors, cashiers, chemists, are not included (G.O., Section 73). The manufacture of tobacco is a state monopoly in Austria, and special ministerial orders and circulars to inspectors lay down the principles on which the latter are to proceed in matters protecting the health and life of workers.* The general regulation of factories and workshops laid down in the Code, applies, since 1885, to the conditions in tobacco factories, which were previously specially exempt, but limitations to the powers of inspectors are laid down. For example, in case they may see fit to examine workers in these establishments, it is ordered that they shall do this "only" in presence "of the manager" "and in such a way as not to endanger the authority of the officials of "the establishment or to affect discipline amongst the workers." As will appear further, the inspectors report on the excellent conditions of health in these government factories.

The accident insurance law of December 28, 1887, and its subsequent amendments, rests, like the German law, on the principle of the substitution of trade risk for personal risk, and has a somewhat similar scope, while it differs in an interesting way as to mode of organisation of the insurance, in matters of finance and of administration. It has been stated, with regard to the question of finance, that the Austrian system of putting aside the necessary capital by the Trade Associations each year, "is generally allowed to be economically preferable to the German system "of meeting only the annual current expenses," its chief advantages being: "The security which it affords that the payment of all claims

* Weigelsperg, Compendium, cited, pp. 366 and *ff.*

"once undertaken will continue to be discharged, and the comparative stability thus obtained in the rate of the annual contributions." With regard to organisation of the employers, it appears to have been necessary in Austria, on account of the differences of race, language, and industrial conditions, to adopt usually a territorial basis as opposed to a trade basis of organisation of the groups. Self-government is not developed in the same degree in these mixed trade groups as in the German associations, but it is stated that the expenses of management are less.* The workers contribute a small proportion to the funds and allowances, in case of incapacity through accident, begin after completion of the fourth week. The courts of arbitration, consisting of chairman and vice-chairman nominated by the ministers of justice and the interior, among state judicial officers, and four assessors, of whom two also are nominated by the minister of justice and the remaining two by employers and employed, respectively, decide finally on cases of appeal from the awards of the industrial authorities. (For jurisdiction of the associations in case of accidents see below, p. 200 & ff').

2.—Administration.

The system of administration of the Industrial Code of the Austrian Empire appears as at once more clearly outlined, more logically developed, and more centralised than has been possible under the wholly different political conditions of the German Empire. (a) Various organs of administration.

Primarily, the Code is enforced by one hierarchy of regulative administrative, and judicial authorities, local, provincial and central, of first, second, and third instance, organised as "industrial authorities" in connection with the ministry of commerce and industry. To this system was superadded by the law of June 17th, 1883, the institution of a body of inspectors of industry, whose first function was to act as "a supervising, reporting, and advising expert organ, auxiliary to" the industrial authorities.

Further, it must be noted that there is a complete system of sanitary organisation under the public health laws of April 30, 1870, and April 3, 1876. While the enforcement of these laws is, as in the case of the Industrial Code, in the hands of the administrative authorities, provincial and local, there is also a system of medical and sanitary expert auxiliaries, e.g.: (1) The Communal Sanitary Committee of three members, including the medical officer (*Oberphysikus*) ; (2) The provincial district surgeons (*Bezirksarzt*) ; (3) The Provincial Board of Health (*Landessanitätsrath*) ; (4) The Higher Board of Health at the Ministry. In addition to these there are other experts for special branches, such as surveying of buildings, and by the terms of the law of April 3rd, 1876, the supervision of dangerous, unhealthy, or inconvenient industrial establishments is expressly declared to be one of the functions of the service for public health (Section 1).†

As the chief inspector of Industries (*Central Gewerbeinspector*), Dr. Franz Migerka, remarks in his last annual report, "While the inspectors form a special organ for the protection of labour, they are in no way a special organ for all technical and sanitary matters, for these matters the building and sanitary officials, auxiliary to the political authorities, appear to be primarily competent."‡

* Royal Commission on Labour, Foreign Reports, vol. x., pp. 115, 117.

† Hygiène et Sécurité des Travailleurs, p. 112.

‡ Bericht der K. K. Gewerbe Inspectoren, p. 8.

(b) The industrial authorities.

The "industrial authorities" of first instance are simply the local, political administrative authorities (*Politischen Verwaltungsbehörden*). It is their duty to control and enforce the observation of the provisions of the Industrial Code; it is to them that the prescribed notice of the opening of an industrial establishment should be sent, and by them that the formal act (*decret*) of concession (with certain exceptions) is drawn up and granted; it is they who are charged with the duty of keeping separate registers, with various particulars, of the free and the conceded industries; finally it is they who try and punish infringements of the Code, in so far as these are not connected with offences properly dealt with by the ordinary criminal courts. In districts where there are provincial police authorities (*Landesfürstliche Polizeibehörden*) the industrial authorities are bound to act in concert with them in cases involving considerations of public security, morality (*Sittlichkeit*), and order (G.O., Sections 141, 144, and 145).

Appeal may be made to the industrial authorities of second instance, who are the provincial or territorial political authorities (*Politischen Länder Stellen*). A certain number of the industries subject to concession are so reserved that application for the concession must be made to these authorities, e.g., the building industry, certain local branches of transport industry, and formation of lending libraries and reading rooms (G.O., Section 142).

The authority of third and last instance in industrial matters is the Minister for the Interior. To this authority is reserved the power of conceding a right to carry on printing industries and transport of persons through various provinces.

(c) Inspectors of industry.

While the relative number of inspectors of industry is less and the scope of their work in some respects wider in the Austrian than in the German Empire, their position nevertheless appears clearer and their joint action with the administrative industrial authorities more effective and consequently the results of their activity have been on the whole less subject to external adverse criticism. A very warm eulogy on the institution, character, and influence of the inspectorate was pronounced by the French ambassador at Vienna, in a recent official report to the French Government on the details of the administration of the Industrial Code.

The character of the institution as a consultative rather than an executive organ, is even more definitely laid down by Austrian than by German law, but, while their relation to the ordinary administrative authorities is, as legally defined, a more strictly subsidiary or auxiliary one, they have yet a source of strength, wanting in the German system, through the centralisation of the service under a chief inspector at Vienna.

"The minister of commerce, acting in concert with the minister of the Interior, is empowered to appoint a sufficient number of inspectors of industry and a chief inspector of industry (*Central Gewerbe-inspector*). . . .

"The inspectors are subordinate to the political provincial authority (*Landesbehörde*) in whose district their headquarters (*Amtsitz*) "lie." (Sections 1 and 2, Law of June 17th, 1885). This point is further emphasised by the fact that the inspectors receive and renew their warrant yearly through the head of the province (*Landeschefs*), and forward their yearly reports to the Minister of Commerce through the political authorities (Sections 8 and 13). It is pointed out, however, in the ministerial circular, addressed to all political *Landeschefs*, December 30, 1883, on the application of the law relating to inspection, that the

Minister of Commerce is empowered by Section 4 to extend or modify the sphere of an inspector's activity in such a way that he may have work in the districts of several *Landeschefs*, and that in such a case it is to the *Landeschef* of his headquarters only that he is subordinate "in a personal serviceable relation." The circular further lays stress on the fact that the law puts limits to the claim of the industrial authorities to apply for the assistance of the inspectors, by showing that visits with a view to authorisation of dangerous occupations, may only be undertaken with reference to the health and safety of the workers engaged in them (Section 6). The advantage to the service of inspection of being organised under a certain control through a chief or central inspector, appears in many ways in the reports. It is best here illustrated by the general survey given, by the Central Inspector in 1895, of the growth of the claims for assistance made by the various administrative authorities. "Honouring as the confidence is which is shown in the many-sided "calls on the inspectors, and enticing as the desire is for the latter to "respond . . . it is equally pressing to set some bounds to the claims, "drawing them outside the strict limits of their function, in view of a "threatened overloading of the service . . . now when it is growing "clearer that such work can only be overtaken at the expense of "inspection proper."*

The official instructions for the chief inspector describe his position as "the expert industrial organ of the Ministry of Commerce in matters "appertaining to the service of inspection. . . . In this capacity his "function is the superintendence and estimation (*Begutachtung*) of the "application of the law by the inspectorate. . . .

"In particular he is under the duty: (a) Of formulating observations on all phases of the organisation of industry which may be of "importance or interest to the administration. (b) Of considering the "occasional or periodical reports of the Inspectors . . . on their "experiences in execution of the duties legally entrusted to them."

A most important clause in these official instructions lays down the principle that when appeals are made by the inspectors against decisions of the industrial authorities to the Minister of the Interior, the judgment of the chief inspector is to be taken and to be embodied in the final decision. With such a reserve force the strength and coherence of the Austrian inspectorate can surely be readily explained. The consequent weight is apparent of the further provisions: (a) That the chief inspector shall watch over the development of the institution of factory inspection with close reference to the "real needs of industrial life, and the possibility of further legislation; (b) Prepare a yearly edition of the reports and recommendations of the staff for the use of the Minister of Commerce.

The inspectors' duties are outlined in the law which provides for their appointment, and consist mainly in "superintendence of the enforcement "of the sections of the Code which relate to: (1) The provisions made "by employers for security and health of their workers in workrooms "and dwelling rooms (if such are provided); (2) The employment of "workers, the daily periods of work, and periodical pauses; (3) The "provision of labour certificates, affixing of working rules and pay- "ment of wages; (4) The technical instruction of young workers." Where infringements or abuses are observed, the inspectors are to require conformity on the part of the employer, and in case of refusal to notify the matter, in regular manner, to the industrial authorities. The latter are to report their action to the inspector without delay. The

* Bericht der K.K. Gewerbe Inspectoren, p. 8.

inspector, if he thinks well, may appeal from a decision of either of the authorities of first or second instance within 14 days (Sections 9 and 10 of the law of June 17, 1883 and Section 148, G.O.). It is open to the industrial authorities, when an inspector has reported on the presence of dangerous or unhealthy conditions in an industrial establishment, to call in the assistance of physicians, chemists, and other experts at the expense of the employer concerned (Section 11, law of June 17, 1883). The services of an inspector as an expert may, on the other hand, be called in by the accident insurance associations, as will be more fully illustrated presently (*infra*, p. 200 & ff.). Other more serious additions to the duties of the inspectors, and which strikingly differentiate the function of the Austrian inspectorate from those of the other great industrial European States are: (a) The provision which lays down (Section 12, law cited) that "in the fulfilment of their task they shall endeavour not "only . . . to secure the benefits of the law for the workers, "but also to lend a tactful support to the employers in carrying out "the requirements of the law, to mediate between the interests of the "employers and employed, on the ground of technical knowledge and "official experience, and to cultivate such relations with both parties "as will put them in a position to maintain harmony between the two "classes ;" (b) The provision which lays down (Section 6, ministerial circular of May 11, 1885) that in addition to safeguarding the use of machinery in technical schools, the inspectors shall, "in the interests of "the development of industry, support the technical schools in their "task . . . by drawing attention as much as possible to their "work, in the district concerned, their suitability for training labour "forces, and the share of the district concerned in them." With a view to the furtherance of this function of the inspectors, the circular provides that they shall be regularly supplied with copies of the Austrian Review of Technical Instruction (*Centralblatt für das gewerbliche Unterrichtswesen in Oesterreich*).

For the fulfilment of his main duty the Austrian inspector has similar powers to those in other countries with regard to right of entry into establishments concerned by the law. There are certain limitations however ; he may only enter at night if processes of manufacture are being carried on, and on all ordinary occasions the employer or his representative have the right of accompanying him through the building ; the inspector may examine anyone employed in the establishment, alone or before witnesses, and he has the right to require the production not only of the registers, notices, &c., but also of the certificates of authorisation (*Genehmigungsurkunden*) and plans for the building. "If anyone of the above-named persons refuses the "inspector entry to places subject to inspection (after production of "his warrant), withdraws himself or others from examination, gives "false answers or incites others to false answers, or if the employer or "his representative refuses to produce the certificates and plans, the "person concerned commits an offence and renders himself liable to be "proceeded against either under the criminal law or under the provi- "sions of the Industrial Code." (Law of June 17, 1883, section 8.) It lies outside the scope of the present inquiry to take account of the work of the inspectors occasioned by their duties as mediators and conciliators in case of strikes and lockouts. The separate reports show how considerable the work is, and how often peace is maintained by the efforts of the inspectors. At the same time it would appear that in the opinion of the chief inspector this function should be held as a subordinate one, for no treatment of it is given in his official summary, beyond brief statements to the effect that action had been taken in 166

cases, and that the invitation to mediate came sometimes from employers, sometimes from employed, sometimes from the industrial authorities.

The subjoined table gives only a partial idea of the work performed by the inspectors, and has here been compiled from the reports for purposes of comparison with the English system. In addition to 10,829 visits of inspection, of which 237 were on Sundays and 106 at night, the inspectors took part in 10,760 special visits of inquiry (in connection with buildings, accidents, &c.), and, apart from routine office work, sent 6,070 reports or special expressions of opinion to the industrial authorities.

TABLE illustrating ORGANISATION of INSPECTION in the
AUSTRIAN EMPIRE.

Province.	District and Head Quarters.	Staff.	Number of Establishments visited in 1895.		Workers employed in these Establishments.		
			Total.	Number without Power.	Total.	Women over 16.	Workers under 16.
Lower Austria (Pop. 2,462,557)	Vienna	A. Chief Inspector (Dr. Migerka). B. Certificated Engineer (Franz Klein).					
	Police District of Vienna. (Vienna.)	1 Inspector 2 Assistants	708	326	33,353	8,969	15,43
	Other parts of Lower Austria. (Wiener Neustadt.)	1 Inspector 1 Assistant (one a certificated chemist).	519	199	30,445	7,362	1,504
Upper Austria and Salzburg (Pop. 945,600).	Upper Austria ; Salzburg. (Linz.)	1 Inspector	531	194	27,225	5,110	1,597
Styria (Pop. 1,249,998).	The district of the towns of Gratz, Cilli, Marburg, Pettau, and a part of Styria. (Gratz.)	1 Inspector 1 Assistant	254	94	20,688	6,305	667
Carinthia and Carniola. (Pop. 851,590).	The other districts of Styria. (Klagenfurt.)	1 Inspector 1 Assistant	1,262	709	15,476	1,858	1,418
Littoral and Dalmatia. (Pop. 1,180,397).	Trieste and its Littoral, Dalmatia. (Trieste.)	1 Inspector	154	93	12,481	2,270	972
Tyrol and Vorarlberg. (Pop. 906,681).	The Tyrol and Vorarlberg. (Innsbruck.)	1 Inspector 1 Assistant	533	250	12,057	4,885	600
Bohemia (Pop. 5,804,065)	The district of the town of Prague and part of Bohemia. (Prague.)	1 Inspector 2 Assistants	425	287	28,708	5,524	2,433
	The district of the town of Reichenberg, and a second part of Bohemia. (Reichenberg.)	1 Inspector 2 Assistants	953	259	68,343	27,874	5,431

Province.	District and Head Quarters.	Staff.	Number of Establishments visited in 1895.		Workers employed in these Establishments.		
			Total.	Number without Power.	Total.	Women over 16.	Workers under 16.
Bohemia— <i>(continued.)</i>	A third sub-division of Bohemia. (Pilsen.)	1 Inspector 1 Assistant	500	239	25,630	6,905	2,293
	A fourth sub-division of Bohemia. (Budweis.)	1 Inspector 1 Assistant	591	407	17,843	6,369	1,442
	A fifth sub-division of Bohemia. (Königrätz.)	1 Assistant, performing duties of an Inspector.	366	108	29,794	11,510	2,054
Moravia (Pop. 2,261,296.)	The district of the towns of Brünn, Iglaū, Znaūn, and part of Moravia. (Brünn.)	1 Inspector 2 Assistants	866	524	37,773	9,881	1,720
	The district of the towns of Olmütz, Kremsier, Hugo-rish - Hradisch, and a second subdivision of Moravia. (Olmütz.)	1 Assistant, performing duties of an Inspector. 1 Assistant	421	165	25,766	7,648	2103
Silesia - (Pop. 589,542.)	Silesia and three districts of Moravia. (Troppau.)	1 Inspector 1 Assistant	561	122	34,325	10,326	2,558
Galicia and Bukowina. (Pop. 7,221,330.)	Galicia and Bukowina. (Lemberg.)	1 Inspector 1 Assistant	564	336	14,497	1,932	738
	Inspection of ships (Vienna.)	1 Special Inspector.	435	307	6,717	728	67
	Inspection of the Vienna public conveyances. (Vienna.)	1 Special Inspector.	—	—	—	—	—

3. Registers, Labour Books, Working Rules, and Notices.

In every industrial establishment registers must be kept of all workers, giving names, age, place of origin, the name of commune supplying the labour book (*Arbeitsbuch*), the date of first employment in the establishment, name of last employer, the mode of employment in the establishment, the sick fund to which the worker belongs, and the date of leaving the establishment; this register is to be open to inspection by the industrial authority (G.O., Section 88). These registers must be preserved by occupiers of industrial establishments for at least three years after the date of the last entry (ministerial order December 24, 1893).*

Every industrial worker must be provided with the prescribed passport or proof of identity (*Anweis*) which is entered in the labour-book (*Arbeitsbuch*). These are supplied at cost price and stamp free

* Compendium über Gewerbeleben, von Weigelsperg, iv. Nachtragsheft. Vienna 1894, p. 64.

by the communal authority of the worker's domicile. The labour books of young persons under 16 must be filled in with the consent of the parents and guardians unless they are not within reach, in which case the commune may act alone. The labour book must show the surname and christian name, date of birth and religion of the worker, whether the worker is married or single, the mode of employment of the worker and columns for date of first employment in and leaving the establishment must be regularly filled in; the signature of the worker must also be entered with the seal of the local authority. The labour book of young workers must show both particulars as to attendance at school and standard reached (*die erworbene Schulbildung*).

The occupier of every industrial establishment must take over the charge of the labour book of each worker entering his employment. It is a criminal offence to falsify entries or knowingly make false entries in any labour book or for any person to use another's labour book as his own or to lend one for this purpose (Sections 79-80*h*). On the application of a worker every occupier of an industrial establishment is bound to give a certificate as to the work done by the applicant in his establishment, and further to add, if the worker desire it, a personal testimony to his character and worth of his work. These particulars may be entered in the labour book and witnessed by the local police authority (Section 81). In factories, and any industrial establishment where over 20 workers are employed together, a copy of the working rules must be affixed and another supplied to each worker entering the establishment. Eight days before the working rules are affixed in the workrooms two copies are to be submitted to the industrial authority of which one is destined to receive the official stamp and be returned to the occupier.

Besides the date of coming into operation the working rules must show:—

- (a.) The various categories of workers and mode of employment, especially of women and young workers.
- (b.) The method of observing rules as to school instruction prescribed for young workers.
- (c.) Periods of employment and pauses in work.
- (d.) Methods of calculating and dates of payment of wages.
- (e.) The powers and duties of foremen.
- (f.) Provision made for aiding workers in case of sickness or accident.
- (g.) Rates of disciplinary fines and of any kind of deduction.
- (h.) Notice required to terminate agreements, and enumerations of cases which terminate the same without notice.

A model set of rules has been drawn up by the authorities for the guidance of employers, which includes all the points prescribed in the code and various other valuable suggestions, e.g., rules for the handling of tools and machinery, for the organisation of workers, for the treatment of apprentices.* The notice to be sent by every intending occupier of a "free" or a handicraft industrial establishment to the industrial authority must show the name, age, dwelling-place, and State to which the occupier belongs (*Staatsangehörigkeit*), the nature of the industry to be carried on, and the address of establishment, where necessary (that is in case of "juridical persons") the name of the legal representative, and address of the competent court of justice. Several occupations of a distinct character may not be given in one notice. If no legal obstacle

* Compendium über Gewerbewesen, von Weigelsperg, ii. Nachtragsheft. Vienna 1892, p. 26.

can be alleged in respect of the person, occupation, or local habitation (*Standort*) a certificate shall then be drawn up for the occupier by the authority. In the contrary case the applicant shall be prohibited from beginning or continuing his undertaking, if necessary, by legal process (G.O., Sections 11-13). In the case of a handicraft industry a further certificate of competency is necessary for the employer, which may be granted either after training in an industrial establishment, or a technical school or workshop (Section 14); The chief inspector, Dr. Migerka, points out that the value and importance of the provision for working rules meets an ever increasing recognition in all directions. Two of the inspectors, namely for Wiener Neustadt and Troppau, show that in disputes between employer and workmen as to hours and wages it is customary for both parties to take their stand on an interpretation of the working rules, which thus serve as a legally witnessed form of contract between them. This tendency strengthens the hands of the inspectors materially in insisting upon a careful drafting of the rules. "A happy result can be pointed to in the fact that many employers who "are not under legal obligations to do so, adopt the system of working "rules, and in this way many grievances arising out of want of clear- "ness in agreements as to wages and conditions of employment may be "avoided in future . . . It is indeed desirable that a recognition "should grow of the facts that a clear contract is the first condition of "good relations between employers and employed and that the former "can do themselves no greater service than in drawing up a set of "rules in which not merely an enunciation of the rights of the employer "and duties of the workmen may be found, but also the duties of the "employer, and rights of the workmen, and that with a clearness "comprehensible to the workers. While the requirements of the law "can easily be so complied with as to secure the official stamp for the "rules, because nothing contrary to the law is contained in them, "many examples, nevertheless, are found every year of which it must be "said that they are little calculated to make things clear . . . "Some also contain provisions in no way illegal which cannot be said "to be inspired by the spirit of humanity and equity."*

4. Sanitary Provisions.

"Every occupier of an industrial establishment is bound to organise "his workrooms at his own cost . . . in such a way as to protect the "life and health of his workers. . . . It is also part of his duty to "take care that during all working hours the workrooms shall be as "light, clean, and free from dust as possible, that ventilation shall be "sufficient, having regard to workers, system of lighting, and effects of "unhealthy vapours, and that, particularly in chemical works, the "organisation and methods of working shall be such as to save the "health of the workers in the fullest possible way. Equally are the "employers bound when they provide lodging for their workers, to take "care that the rooms are in no way hurtful to health. Finally, they "are bound when they employ young workers under 18 or women, to "take special care in the interests of morality to make such arrange- "ments as are necessary to protect the age and sex of their workers" (G.O., Section 74).

All further, more detailed, regulations in sanitary matters (apart from the question of unhealthy and dangerous occupations) are left to the provisions of the public health laws of 1870 and 1876, and the

* Berichte der K.K. Gewerbe Inspectoren, 1895, p. 20.

sanitary administrative authorities constituted in connection therewith (*cf. supra*, p. 191). Not more than 137 cases of insanitary conditions were reported by the inspectors to sanitary authorities during 1894-95, of which 120 related to sleeping accommodation as distinct from work-rooms. The number appears small, but it may be assumed that in many cases the inspectors had been able to effect improvements without recourse to outside authority. Further, as the chief inspector points out, a growing tendency is found among occupiers of new workplaces to set the same in order before commencing processes of manufacture, a development doubtless attributable to the section of the Industrial Code which enforces preliminary authorisation in all establishments with machinery driven by power, in addition to the scheduled industries (Section 27).

"The majority of manufacturers," writes the factory inspector at Königgrätz, "are coming to the conclusion that it is far more profitable for them to conform to the conditions laid down in Section 74, G.O., before beginning manufacturing processes, because this is the surest way of avoiding vexatious disturbances of the business otherwise inevitable."*

A different view is given by the inspector at Lemberg, who finds numerous defects and abuses, even in factories built since the Code was last amended. "The cause of this regrettable state of affairs is to be seen in the fact that the manufacturer merely makes a promise to carry out the conditions laid down in the certificate from the industrial authority, at the same time, as a matter of fact, arranging his establishment according to his own convenience. Even subsequent orders, based upon proceedings initiated by the inspector, are not carried out in a thorough manner. Cases also are not unknown in which new establishments have been started without any attempt to obtain the necessary certificate . . . and the services of the industrial authority are only brought in when it is extremely difficult to remove the defects. . . . Cleanly workrooms are a rarity, dirty walls, ceilings, and windows, floors rarely washed are found everywhere. . . . A praiseworthy exception may be seen in the tobacco factories, which stand out as a model. . . . As regards ventilation, the system is frequently at fault, and it is comprehensible that workrooms fitted only with ventilators which cause an unpleasant draught are only ventilated when visited by the inspector."†

The inspector for Budweis remarks that the manufacturers are giving increased attention to this question of ventilation. "The cotton spinning mills of Messrs Kuffler and Reichel, in Broditz, are ventilated in a brilliantly successful manner by 57 machines for moistening and renewing the air. In the Fez factory of Tynaz Stein in Strakonitz, the felt dust is carried by an exhaustor direct from the machines into a receptacle. The owner said that he owed this arrangement, which was highly satisfactory both to himself and the workers, to a branch exhibition, at Pilsen, of the Vienna Museum of industrial hygiene, where he saw a model which he had adopted."

This inspector lays great stress upon the insufficiency of ordinary ventilators or air propellers in the windows or walls, where heavy dust or vapours are concerned, and states that he insists on the importance of removing the dust and gases from the spot where they arise.

* Berichte der K.K. Gewerbe Inspectoren, 1895, p. 252.

† *Ibid.*, p. 348.

5. Security against Accidents.

“ Every occupier of an industrial establishment is bound at his own cost to provide and maintain workrooms, machinery, and apparatus in such a condition, having regard to the organisation of the industry, as is necessary for the protection of the life and health of the workers.

“ In particular the occupier has to take care that machinery, arrangement of the works and their parts, such as fly-wheels, driving bands, shafting, hoists, vats, pans, boilers, &c. shall be so enclosed or so provided with fencing that danger cannot easily arise for workers with reasonable care” (G.O., Section 74).

It is difficult to estimate how far the last qualifying clause operates in practice, but at first sight it would appear likely to weaken the general provision for security in such a way as to make it distinctly less valuable than the corresponding clause in the German Industrial Code.

The further indirect provision for safety arising out of the accident insurance law presents, as has already been seen, interesting points for comparison with the similar German system.

Accident insurance. The accident insurance associations, organised as they are generally, with reference to the wishes of the different nationalities speaking different languages, within the Empire, on a territorial instead of a trade division, although there are exceptions to be noted presently, have not quite the same independence of position as in Germany. They have not such full powers of self-government and neither lay down nor enforce special regulations for safety on such independent lines. The development of their function is largely in the hands of the industrial or political authorities, as may be best illustrated by the section most directly bearing on the prevention of accidents (U.V.G., Section 28).

“ The accident insurance association is authorised to address a request to the government inspector of industry that he should visit the industrial establishments subject to compulsory insurance. The inspector is bound to respond zealously to these requests.

“ For the purpose of these inspections all the provisions of the law of June 17, 1883 (on the institution of inspectors) are applicable. The employer or his representatives are bound to afford the inspector all the information he may desire, especially upon any point in the nature of the industry which may relate to possibility of accident.

“ The inspector is bound to forward to the association all the information he may have gathered. Resting on such information the insurance association has then the right to address a request to the local political authorities for the promulgation of rules prescribing measures to be taken by employers for the protection of workmen against accidents during their work and the precautions to be observed by the workers for avoidance of dangers.

“ In the cases where the political authorities have acted on the request of the insurance associations, copies of the regulations, as soon as published, shall be forwarded to the employers, and by them affixed in a suitable place in the workrooms. At the same time the employer has the right of appeal against the regulations to the next administrative authority.

“ The expenses for inspectors resulting from the first paragraph of this section and also any necessary increase of staff to perform the duties required shall be considered as expenses of administration, and be borne by the insurance associations. The total amount is estimated by the Minister of Commerce in concert with the Minister of the Interior, and by them apportioned among the various associations in

"proportion to the importance of the enterprises" (U.V.G., Section "28).

Independently of the district insurance associations the law permits the formation of free insurance associations among members of one trade; these are subject, however, to the same State supervision as the other associations (Section 58).

All the associations are bound to present an annual report to the Minister of the Interior on accident statistics, on amount of indemnities, and on their financial condition (Section 60).

The regulations as to notice of accidents are as follows:—"Every accident in an industrial establishment, under the insurance laws, by which a person there employed is killed or has received an injury resulting in death or an incapacity for work of not less than three days must be reported, by the employer or the person in charge of the establishment at the time of the accident, in prescribed form, within five days, to the political authority of first instance (Section 29). The political authority must forward a copy of this notice immediately to the accident association (Section 30)." A special circular of October 1884, re-enforced by another of November 1890, binds the political authorities to send another copy to the inspector for the district so that he may make any inquiry that he sees fit into the matter. A claim to indemnity arises in case of death or incapacity to work, for over four weeks, of the insured person. In such cases a special inquiry must be made as soon as possible by the political authority into the cause of the accident, the identity and occupation of the killed or injured person and other allied matters. The insurance association may be represented at the inquiry and due notice must be given them to this end. The costs of the inquiry and of the services, where necessary, of an expert are borne by the association. The results are to be communicated to the association (Section 31).

The Minister of the Interior is empowered to form an expert council to assist him in administering the accident insurance laws (Section 49). The political authorities are bound to render every assistance in their power to the accident associations and even without special application to communicate all information to the associations which may be of importance to them (Section 50).

One of the most recent administrative supplements to the accident insurance laws was an Order of the Ministers for the Interior and Education, dated February 3, 1895, for the authorisation of the formation of a body of insurance experts. It is easily to be seen that the laws relating to insurance, above briefly indicated, must necessarily lead to the development of a whole new profession of a highly specialised character.

Returning to the subject more immediately under investigation, namely the methods of control of means of security by the Government inspectors, it is interesting to note the formulation of an important principle for their guidance in a Ministerial circular of 1891. It is laid down in this circular, drawn up in reply to a query raised by a *Statthalter*, that while it is the duty of the inspector to give the employer every advice and assistance in his power in order to complete arrangements for the security of workers, it is no necessary part of his duty to give detailed instructions as to kinds of guards and their construction; on the contrary it is the duty of an employer, informed by an inspector that his guards are insufficient, to call in special expert advice to remedy the deficiency.* The chief inspector writes for the

* Weigelsberg, Compendium ii., p. 26.

year 1895 that: "In spite of all efforts in the direction of security, " accidents will yet continue to occur, because they result not only " from the machine itself but also from a number of causes which " cannot be always controlled by the employer; sometimes care on the " part of the worker is wanting, in other cases chance (*Zufall*) plays a " not unimportant part." He further cites a case of a workwoman caught on a shaft, after serious warning against approaching it, to show that while such an accident might have been prevented by a sufficient fence, it is also necessary to keep persons of a certain temperament under strict regulation. "Amongst the duties of the managers is that of " excluding from the approach to machinery those workers whose under- " standing of the dormant risks in use of machinery cannot be aroused or " whose bodily infirmities form for them a continual danger in proximity " to machinery."* The inspector at Troppau (Moravia) points out that a certain passive resistance among manufacturers to carrying out all prescribed measures of security may best be met through the procedure put in the hands of the authorities by the section (Section 25) which requires that a certificate of authorisation shall be obtained for all factories: "If the authorisation follows some time after the " practical completion of the establishment then suitable prescriptions " for the security and health of the workers may meet with essential " difficulties. It is then not easy to prohibit the commencement of the " manufacture, whether one regards the needs of those seeking employ- " ment or the interests of production. On such grounds it is eminently " desirable that all building and industrial authorities should at the " outset categorically prohibit every attempt to commence unsuitable " erections."† The same inspector reports on work done towards increasing security against accidents in case of fire, by diminishing the overcrowding of looms in textile factories, and of attempts to increase security in the use of lifts by enforcing use of automatic guards. In one case, where an employer had delayed in carrying out the instruction, a woman fell down the open shaft and received serious injuries. "The " provision of automatic barriers and safety arrangements for hoists, " although requiring a certain forethought and cost is in no way a " problem with which difficulties are necessarily involved." The inspector for Königgrätz writes also: "A continuing cause of bad " accidents is found in the hoists. Faulty construction on the one " hand, insufficient supervision on the other hand, are the causes."

The accident insurance associations in some districts make very little use of the power given them by Section 28 of the insurance law, to call upon inspectors for advice and assistance in the prevention of accidents. The inspector for Pilsen writes: "On the basis of Section 28, U.V.G., the association called on us in five cases only for our assistance."‡ In Reichenberg the inspector gave opinions under the same section in 11 cases.

The inspectors were invited to take part in 7,244 inquiries under the accident insurance law; they gave their services, however, only in 661 cases because the majority of inquiries have far less to do with circumstances leading to prevention of accidents than with substantiation of workers' claims to indemnities.

Most of the inspectors give an interesting analysis of the causes and results of the accidents reported to them by the industrial authorities. In view of the different organisation and administration of accident insurance in Austria and Germany and of the time that has now elapsed

* Bericht der K.K. Gewerbe Inspectoren, 1895, p. 11.

† *Ibid.*, p. 325.

‡ *Ibid.*, p. 219.

since these laws came into operation it would be extremely interesting and practically instructive if statistics on a similar scale as to accidents (their causes as well as results, their proportion to total numbers employed in the separate industries, and the like) were available in England for purposes of comparison. A comparison between countries with factory laws so varied as England, France, Germany, and Austria, must lead to helpful conclusions on the question of attainable security.

Out of 28,000 accidents reported to Austrian inspectors in the year 1894-5, five-eights of the total were cases of less than four weeks unfitness for work but one-eighth resulted in lasting incapacity.

6. Regulation of Dangerous and Unhealthy occupations.

Austria has not the elaborate provision that Germany possesses Methods of for various methods of control of dangerous and unhealthy occupations control. in the interests of adult male workers as well as of women and children —a difference which may perhaps be partly accounted for by a less rapid and sudden development of industry on a large scale. The Industrial Code of Austria has not been directly amended since 1885, whereas some of the most interesting developments in Germany date from 1891.*

The methods are as follows :—

1. By requiring a certificate of authorisation which shows (among other matters) that due provision has been made for the security and health of workers in all work places with furnaces, or machinery driven by power, or liable to unhealthy influences, before any such industrial establishment can be opened or extended. The preliminary inquiry by the competent authorities must be particularly stringent in the case of the following 52 processes or industries :—

1. Flaying houses; 2. Preparation of fireworks and explosives;
3. Brush, horsehair, and feather-cleaning works; 4. Blood boiling works (*Blutlaugen Siedereien*); 5. Chemical works; 6. Cement works;
7. Artificial manure works; 8. Catgut manufacture; 9. Distillation of mineral oils; 10. Roof-felting works; 11. Catgut cleaning works;
12. Varnish and turpentine works; 13. Flax and hemp steeping works; 14. Tripe boiling; 15. Gold and silver scraping mills;
16. Glass works; 17. Fellmongering; 18. Horn button factories;
19. Hop drying kilns; 20. Wood dipping works; 21. Candle-making works; 22. Bone bleaching; 23. Bone boiling; 24. Bone grinding;
25. Bone kilns and spodium factories; 26. Boiler works; 27. Glue works; 28. Gas works; 29. Smelting works and blast furnaces;
30. Engineering works; 31. Oil, varnish, and lacquer factories; 32. Pitch and asphalt works; 33. Paper mills; 34. Hydrochloric acid factories; 35. Saltpetre factories; 36. Chloride of ammonia factories;
37. Wool and cotton singeing; 38. Sulphuric acid works; 39. Slaughter-houses; 40. Bleaching works; 41. Soap works; 42. Mirror-amalgam works; 43. Stone quarrying, brickfields, lime and gypsum kilns; 44. Tallow-boiling works; 45. Potteries; 46. Oilcloth works; 47. Match factories; 48. Sugar and spirit factories; 49. Coke preparing works; 50. Anthracite tar works; 51. Wood tar works; 52. Soot kilns.

The minister of commerce in conjunction with the minister of the interior is empowered to modify this list by special order (G.O., Section 27).

2. By promulgation of orders by the industrial or political authorities in pursuance of the general principles laid down in Section 74 for 2. By orders of local authorities.

* See however footnote on page 188.

security and health of workers (*supra*, p. 198.). In that section it is specially shown that employers are bound to take measures to prevent the harmful effects of noxious emanations and that in chemical works matters shall be so organised as to secure the health of the workers in the fullest possible way. (G.O., Sections 74 and 141.)

3. Special ministerial orders.

Lucifer match works.

3. By special administrative orders of the Minister of Commerce acting in concert with the Minister of the Interior after hearing the views of the Chambers of Commerce and Industry; these orders may specify "those specially dangerous or unhealthy industrial occupations "in which young workers or women may not be employed or only "conditionally employed. (G.O., Section 94.)"

Special rules have been drawn up by the last named method for the case of *lucifer match works*. The order is dated January 17, 1885 and no other examples of such special regulations are given in the compendium of labour legislation on which this summary is mainly based. The regulations for lucifer match works were drawn up after consultation with the higher sanitary council and are as follows:—

A.—*For works in which yellow or white phosphorus is used.*—

(1.) Every workroom in these works must be of a suitable size and height, with means of ventilation in working order, with exits easily reached, and must be entirely shut off from communication with living rooms, kitchen, or sleeping rooms.

(2.) The mixing, dipping, and drying rooms must be separate, strongly ventilated and suitably planned rooms.

(3.) With a view to complete renewal of the air, the windows and doors shall be thrown wide open at the midday pause and morning and evening before and after the period of work. In rooms where there is any possibility that the materials containing phosphorus are scattered on the floor, a daily cleaning out at the end of work shall take place. The walls must be limewashed at least once a year.

(4.) The sweepings of the rooms may not be stored in receptacles or cellars, but must be daily destroyed by fire.

(5.) The clearing out of the drying room may only take place after the fumes have been entirely drawn off.

(6.) The stores of matches may only be kept in cool airy places separated from the workrooms.

(7.) Only quite healthy persons may be employed in the mixing, dipping, and drying rooms, and the workers in these rooms must be changed from time to time to other departments. The change must be effected at once on the smallest symptom of pain in teeth or jaws.

(8.) The employer is bound to provide overalls for workers engaged in the processes just named and to see that these overalls are taken off and aired at the close of work.

(9.) The employer is bound to see that worker's outdoor garments are not taken off in workrooms but are kept in a special cloak room. He must also provide a suitable number of wash-basins and take care that the workers wash their face and hands and rinse their mouths before taking food or leaving the factory.

(10.) The employer must see that no food is brought into workrooms, and must particularly warn workers against eating anything before changing clothes, washing the hands and rinsing the mouth. No worker may be in the workrooms during the midday pause.

(11.) The employer is bound to engage the services of a doctor to watch over the health of the workers. The doctor must examine every worker before entering and at repeated intervals, rejecting all who are scrofulous or have decayed teeth, and must enter the results of his

work in a prescribed register open to an official inspection. The doctor must satisfy himself that the rules on behalf of the workers are observed and draw the attention of the employer, or his representative, to any infringements. The doctor is further bound to report every case of necrosis at once to the industrial authority.

(12.) The provincial medical officer must visit the works from time to time, and convince himself that these regulations are being carried out, and report on the results of his enquiry.

B. *For works in which only red phosphorus is used.*—(1.) The following materials may only be dealt with in special workrooms separated from other departments: red phosphorus, chlorate of potash (*chlorsaures Kali*), sulphuric antimony (*Schwefelantimon*), and the like; chlorate of potash may only be stored in special separate receptacles.

(2.) Preparation of the paste may only be entrusted to special workmen working under careful regulations.

(3.) The chlorate of potash usually serving as tinder may only be used in a finely ground condition and mixed with the inflammable materials such as red phosphorus, also finely ground, in a moist condition under full precautions against knocks, blows, or friction.

(4.) The preparation of the friction surface must take place in a separate room. Offences against these rules, in so far as they do not fall under the ordinary penal law, are dealt with under the Ministerial Order of September 30, 1857. A copy of the rules is to be affixed in every workplace, in a place open to the workers.

It thus appears that a restriction of the employment of women or children in this industry has not yet been attempted under Section 94.

Four cases of necrosis are reported by the inspectors as coming to their knowledge in 1894–5, but one of the inspectors points out that it is extremely difficult for the officials to obtain access to the sick registers of the industrial sick funds. All the cases reported on present the ordinary painful features. Two cases in Galizia were met by support from sick funds for 20 weeks, at the end of which time the sufferers were still entirely unfit for work. The inspector reports: “I have not succeeded in obtaining from the employers on their behalf either a steady contribution or an indemnity paid down. Such an industrial disease, which turns the worker into a helpless cripple, should be fully provided for by the accident insurance law. These terrible consequences could not arise if the special rules for lucifer match works were thoroughly carried out.”

The inspector for Budweis writes that a manufacturer had proposed to him the following rules as desirable so long as the use of white phosphorus was not absolutely forbidden: “(1) Above everything it is important that the paste shall not be prepared in open vessels or touched by hand and, that it shall be prepared in a closed vessel provided with a tube whence the fumes are carried direct to the chimney. (2) An addition shall be made to the paste of 2 per cent. of thick turpentine, by which the evil smell and fumes of the phosphorus will be mitigated. (3) Washing of hands before eating is not efficacious. The phosphorus dust which gathers in wrinkles of the skin is not removed entirely by washing, especially if this is not of the most thorough character. . . . It is much more important that the workers should draw on freshly washed linen gloves before eating. . . . (4) In the drying and boxing rooms it is important that sawdust should be used rather than sand for extinguishing lighted matches. A single application of sawdust is sufficient to put out the

" burning match, while sand being heavier often lessens the flame " without extinguishing it. The consequence is that the boxer or carrier " breathes in the fumes from the slowly smoking match. (5) Since in " many factories materials are used in the preparation of the paste " which require a temperature of 30° Reaumur in the drying rooms, " it is important that the proportion of the materials and relative " quantity of phosphorus should be laid down by law." *

An example of the method of dealing with dangerous or unhealthy industries by order of the political authorities may be seen in the action of the inspector for Vienna, who made in 1894-5 a special inquiry into the conditions in brushmaking works, tanneries, and fellmongerries, with a view to the promulgation of special rules for these industries where a particularly high morbidity had been detected through the records in the guild sick funds. †

Anthrax.

A special inquiry ordered by the Minister of the Interior among the industrial authorities of the same district into the results shown by the general sick funds, proved that anthrax was frequently found amongst workers in brushmaking factories and horsehair spinneries. In the former case three persons died of this disease during 1894, while three recovered. In a single horsehair spinning in the same district one death occurred on an average each year. In this case the employer was ordered to carry out special ventilation in the sorting room, to attach mechanical air propellers to the hackling and mixing machines, to deal with raw material only after it had been subjected to a temperature of at least 105° Centigrade, to provide respirators and overalls for workers, and to provide cloak rooms and washing apparatus with disinfectant soap, while all meals in workrooms were to be prohibited.

Letter-press printing.

Many other occupations were inquired into and subjected to special orders at the same time. It was found that letter-press printers suffered in a higher degree from sicknesses than any other workers, and that they suffer specially both from affections of the breathing organs and from lead poisoning. The use of respirators has been required.

Dyers.

Dyers suffer from affections of the digestive organs and skin diseases as well as from blood-poisoning and rheumatism. "The unhealthy " conditions will be improved by drawing off the steam in the damp " rooms. The affections of the skin must be traced to the influences of " the dye vats, sometimes acid, sometimes alkaline, sometimes cold, " sometimes warm. . . . Poisoning arises in the dyeing of silks " in which salts of lead are used to increase the weight of the silk. " Yarn shaken after dyeing gives out a cloud of dust which contains " 30 per cent. of lead. Such processes should be carried on only by " machinery provided with exhaust ventilators." ‡

Rag sorters.

The inspector for Graz points out that a great reduction in the cases of sickness among rag-sorters has been effected by improved sanitary conditions in the factories. The improvement has been brought about by "the repeated instigations" of the inspectors together with a "con- " current supervision by the medical officer of the political authorities." "Special apparatus for removing dust from the rags has been provided, " and the sorting takes place only in large workrooms regularly aired " and disinfected; the workers are provided with lavatories which they " are compelled to use before leaving the workrooms. In consequence of " these arrangements the health and mortality of the workers in this

* Bericht der K.K. Gewerbe Inspectoren, 1895, p. 241.

† Ibid., p. 39.

‡ Ibid., p. 122.

"category is not out of the ordinary." In the year ending December 1894, in one sick fund enrolling between 100 and 140 workers, only 10 had received aid, and of these four suffered from bronchial catarrh. "Two deaths occurred in the year, one a case of anthrax, the other a "case of tuberculosis."*

A conflict of authorities may be seen in the case cited by the inspector at Brünn, where for a paper factory a condition had been laid down in the building certificate (on the recommendation of the inspector) that the rag-sorting should take place not on wooden benches but over iron gratings closed in in boxes, and provided with exhaust ventilators for drawing the dust downwards from the workers. The officer of the sanitary authority found the ventilation of the room insufficient and ordered mechanical ventilators in the roof. The inspector finding the effect of his provision nullified was compelled to refer the case to the *Statthalter* for decision, and the result was not announced at the time he reported.†

7.—*Periods of Employment and Pauses.*

(a.) *Period for Adult Workers.*

Austria holds a distinct place in the history of protective legislation for labour by reason of the adoption (1885) of a general limitation of hours in factories for adult male as well as female workers, to "11 in the 24 at most, exclusive of the prescribed pauses."

Overtime is permitted and provided for by special regulations, to be considered presently.

Neither the general limitation of hours to 11 nor the overtime regulations apply to the employment of adult workers in such subsidiary processes as heating of the boiler and lighting and cleaning of the workrooms (G.O., Section 96a). Night work is generally prohibited for women in factories, that is to say, employment before 5 a.m. or after 8 p.m. This prohibition may be relaxed for special branches of industry by an administrative order, but the period for the women employed at night may not exceed the prescribed maximum.

Periods of employment are not regulated, whether for men or women (over 16 years) in the industrial establishments which are not classed as factories.

Pauses in work are generally prescribed for all classes of industrial establishments, but there are many exceptions. The pauses shall amount to not less than one and a half hours, and so far as the nature of the work will permit, one hour shall be given at midday. If the morning and the afternoon spells do not exceed five hours, each, a pause of one hour at midday shall suffice. The regulation as to pauses holds good for night work as well as day work. Certain branches of industry may be partially exempted from the regulations as to pauses by special order of the Ministers for Commerce and the Interior (G.O., Section 74a).

Not less than twenty different classes of industry with various branches have been partially or wholly exempted from the necessity of conforming to the fixed rule as to pauses. Many of them, such as forges, metal and engineering works, breweries, glass works, grain mills, are mainly men's industries, but several of the textile industries, paper works, and other industries in which women and young workers are largely

* Bericht der K. K. Gewerbe Inspectoren, 1895, p. 122.

† *Ibid.*, p. 273.

employed are included in the exemption (Order of May 27, 1885).* Abuses under this order for exceptions to the rule of fixed pauses in work led to the issue in November 1888 of an interpreting circular. In it was pointed out that the system whereby machinery was continuously kept running, and workers took turns for meal-times or pauses for rest led to an intensified strain on workers, and real extension of their day's labour. "It must be recollect that most employers only engage the 'least number of workers necessary for tending machinery,' and that if a worker on his return from a pause has to tend twice his ordinary share of machinery the intensified strain nullifies the effect of his pause. Where such a system prevails the legal day is to be interpreted as inclusive of the nominal pauses by the inspectors and industrial authorities.†

(b.) Periods for Young Persons and Children.

Children may not be employed in factories before the completion of their fourteenth year, nor in any kind of regular industrial occupation before completion of their twelfth year. Children between their twelfth and fourteenth years may only be employed in regular industrial occupations in so far as the work is not injurious to their health nor of a kind to hinder physical development, and in so far as they are not prevented from complying with the regulations as to attendance at school. Children up to fourteen years of age may not be employed longer than eight hours a day in industrial work. Young workers between fourteen and sixteen years of age in factories may not be employed except at light work which cannot affect their health or hinder physical development. Neither young persons nor children may be employed before 5 a.m. nor after 8 p.m., except by special ministerial regulation on account of climatic or other important reasons (G.O., Sections 93-96b).

(c.) Certain Special Provisions for Young Workers and Women.

Employers are bound, when they employ young workers under 18 or women, to take special care, in the interests of morality, to make such arrangements as are necessary to protect the age and sex of these workers (G.O., Section 74).

Employers are bound to allow young workers under 18 the necessary time to attend evening technical or continuation schools (Section 75a).

Employers, or, more accurately, perhaps, occupiers of industrial establishments (*Gewerbeinhaber*) employing workers under 16 must keep a register of the same showing their names, ages, and addresses, as well as the names and addresses of their parents and guardians; the date of first employment, and, when it occurs, the date of leaving must be entered in this register, which is to be open to the inspection of the industrial authority (G.O., Section 96).

The Minister of Commerce in conjunction with the Minister of the Interior, after taking evidence from the Chambers of Commerce and Industry may, by special order, prohibit or limit the employment of young persons and women in dangerous or unhealthy occupations. Women may not be employed in regular industrial occupation within four weeks after giving birth to a child (Section 94).

The inspectors' reports for the year 1894-5 tend to show that the provisions relating to protected persons are in the main observed in

* Compendium über Gewerbewesen, pp. 173 and ff.

† *Ibid.*, p. 177-9.

factories. The inspector for Olmütz found one girl under 12 years employed in a lucifer match factory, and the inspectors in eight other districts found altogether 54 children not fully 14 years old employed in various factories (glass, textile, paper, &c.). In a few cases women were found engaged in work pronounced to be unsuitable for them, as, for example, by the inspector for Lower Austria, in coal heaving or canal digging. The inspector for the Brünn section of Moravia opposed an attempt of employers to replace men by women in certain branches of the iron industry, *e.g.*, at grindstones, on the ground that peculiar unhealthiness made them unsuitable occupations for them. Many of the inspectors' reports show that most miserable conditions for women, both in sanitary matters and as to long hours, prevail in the smaller industries.

Cases of employment of women within the limits of the prescribed four weeks after confinement were made the subject of proceedings, but it is expressly observed that control in this matter cannot be made effective until a suitable system of registration has been established.*

Setting on one side the abuses and evils existing in the small and sweated industries, a generally favourable report of conditions as to hours is given by the inspectors. Several report that partly through a general agitation in favour of a shorter working day, partly for other reasons, hours have fallen not only in isolated cases but in entire branches of industry to 10½, 10, and 9, a day thus falling very decidedly below the legal maximum. The shorter hours are found mainly in textile factories, but also in engineering works the regular hours do not exceed 10 a day. The inspector at Brünn reports the opinion of employers in the silk industry, that no falling off in quantity or quality of work has accompanied the reduction of hours. The inspector at Reichenberg is of opinion that the evidence is in favour of a further reduction of the legal maximum period. The inspector for wharves and docks quotes a case where more work is now turned out in nine hours than formerly in ten.†

Certain striking instances of infringement of the law in respect of periods in factories are given by the inspectors, but these are expressly declared to be entirely exceptional.‡

(d.) *Sunday-rest and Holidays (Feiertagen).*

The provisions in Section 75 of the Industrial Code for Sunday-rest from industrial labour are now superseded by the regulations laid down in the Law of January 6, 1895, and the ministerial circular elucidating the same.

Article I.—All industrial labour must cease on Sunday.

Article II.—The Sunday rest must commence at latest by 6 a.m. for the whole staff of every establishment and must continue for at least 24 hours.

Article III.—Exceptions are as follows:—

1. Cleaning and arrangement of rooms and apparatus, on which regular maintenance of the manufacture depends, and which cannot be effected at ordinary times without serious disturbance or danger for life or health of workers.
2. Necessary caretaking of the establishment.
3. Work in connection with annual stock-taking.

* Bericht der K.K. Gewerbe Inspectoren, pp. 13, 50, and 196.

† *Ibid.*, pp. 382 and *ff.*, 196 and *ff.*, 386.

‡ *Ibid.*, pp. 14, 196, &c.

4. Work of a temporary character not postponable, arising either out of considerations of security or of cases of necessity (*Nothfällen*).
5. Personal work of the occupier, without assistance from an employé, which is not carried on in public.

Article IV.—Manufacturers employing workers on Sunday, in the manner specified under heads 1, 2, 3, and 4, must keep a register showing for each Sunday the names of the workers employed, the place and length of their employment, and the kind of work they had to do. This register is to be shown on demand to the industrial authority and the inspector.

Further, the manufacturer is bound in case of work specified under heads 3 and 4 to send formal notice of his intention beforehand to the industrial authority. If the need first becomes apparent on the Sunday the notice must be sent immediately the work is finished. . . . In both cases the manufacturer is bound to prove whether the legal conditions are fulfilled.

Article V.—If the work referred to under heads 1, 2, and 4, prevent the workers from attending the morning service at their church, the manufacturer is bound in all cases to set these workers free to attend the service on the next following Sunday.

If the work under these same heads lasts longer than three hours the workers must have a 24 hours' rest on the following Sunday, or, if the case will not permit this, on a week day, but a six hours' rest on two days of the week may be substituted.

Article VI.—The Minister of Commerce in concert with other ministers concerned is empowered to draw up an administrative order permitting exceptions for special branches of industry, in which from their nature an interruption is impossible, or in which the needs of the public require it.

In industries carried on in establishments which are continuously at work, on account of which Sunday labour is permitted, and in other cases coming under the exception permitted by this article, only those processes expressly mentioned in the order are admitted, and every other process, including preparatory and subsidiary occupations, must cease on Sunday. The regulation of the processes permitted on Sunday and the fulfilment of the conditions attached thereto is alike for all establishments and subject to the substitution of an equivalent rest as laid down in Article V. The regulations are to be set forth in the working rules affixed in a suitable part of the workrooms, in the language customary in the district.

Articles VII. and VIII. provide for special modifications of the law in particular districts, and *Articles IX. to XII.* make special provision as to Sunday labour in commercial establishments.

Article XIV.—On holidays (*Feiertagen*) sufficient time must be given to workers to permit of their attending public worship, according to their confession, before noon.

The Order of April 24th 1895 determines the industries to which Article VI. in the above-cited law shall apply, and the conditions

attached to the exception. Forty-eight different industries are named, of which it may suffice to give the following examples :—

Industries and processes in which Sunday labour is permitted.	Conditions in case of workers employed over 3 hours.
<p><i>Sea Salt Works.</i>—Sunday labour allowed from May to August, inclusive, for the purpose of obtaining and storing the salt.</p>	<p>A 24 hours' rest on the next following Sunday, or on a week-day, or 6 hours on two week-days.</p>
<p><i>Iron Works.</i>—(a.) Blast Furnaces for the conveyance of coal, coke, metal, for service of waterworks, bellows and air-heating apparatus, for stoking and drawing-off, &c., &c.</p>	<p>A 24 hours' rest on every second Sunday if the work is interrupted by at least 6 hours on Sundays or a reserve shift can be employed. In the latter case the relieving workers must rest 12 hours before and after the regular employment, and a rest equivalent to that given the workers in general must be substituted.</p>
<p>(b.) Bessemer and Martin works attached to blast furnaces, for the conveyance of rough iron to the converters, for the conveyance of the by-products to the Martin furnaces, for tending the generators and bellows for the charging and smelting processes at the converters, &c., &c.</p>	
<p>(c.) Heating and puddling furnaces.</p>	<p>A 24 hours' rest on every second Sunday.</p>
<p>(d.) Cylinder works.</p>	
<p><i>Lime, Cement and Gypsum Kilns.</i>—Absolutely necessary employment for attending to the kilns.</p>	<p>The same as at iron works (a).</p>
<p><i>Brickfields.</i>—Sunday labour is permitted :—</p>	<p>The same.</p>
<p>(a.) For tending the kilns, under condition that the lighting up shall take place at latest before 6 p.m. on Saturday.</p>	
<p>(b.) For preparation of the clay by adult male workers during two hours.</p>	
<p><i>Potteries.</i>—Sunday employment of absolutely necessary persons :—</p>	<p>The same.</p>
<p>(a.) For tending the ovens.</p>	
<p>(b.) For ornamental work and setting out of articles in the drying-house where necessary to prevent alteration of form.</p>	
<p><i>Dye-works.</i>—With the same reservation.</p>	<p>The same.</p>
<p>(a.) Supervision of oxydation chambers in black-dyeing.</p>	
<p>(b.) In indigo dyeing, for stirring up the contents of the indigo vats.</p>	
<p>(c.) In silk dyeing for the finishing of chemical processes begun before 12 noon on Saturday.</p>	
<p><i>Manufacture and Sale of Soda-water.</i>—From April to October, inclusive, Sunday labour is permitted.</p>	<p>A 24 hours' rest on the next succeeding Sunday.</p>
<p>(a.) In manufacture up till 12 noon.</p>	<p>As in the case of salt works.</p>
<p>(b.) In delivering and retailing products.</p>	

(e) Overtime and Night Work.

Perhaps the most important preliminary observation to be made with regard to regulation of overtime in Austria is that the principle is laid down by the Industrial Code that "overtime shall be specially paid for" (Section 96a).

The Ministers of Commerce and the Interior, after taking evidence from the Chambers of Commerce and Industry, may by an administrative order permit the general extension of the legal day in factories by one hour, in certain branches of industry, where the circumstances seem to require it. The list of such industries is to be revised every three years. The ministers are also empowered to make special arrangements for the regulation of shifts where work must be continuously carried on, or where the interests of consumers are at stake, or where there is urgent public reason for it.

Where *vis major* or unforeseen accident has interrupted the ordinary course of work a limited extension of the legal day for three weeks can be granted by the industrial authority of first instance; for any further extension application must be made to the political provincial authority (*politischen Landesbehörde*). In case of urgent need the legal day can be extended on not more than three days in one month by simple notification to the industrial authority of first instance (G.O., Section 96a).

The permanent extension of the legal day to 12 hours was granted by the Ministerial order of May 27th, 1885, subject to a periodical renewal, which appears not to have been subsequently withheld, to the following branches of industry: Silk throwing, spinning, and combing; silk weaving and ribbon making; wool spinning; cotton spinning and weaving; flax spinning, hemp spinning and rope making; dyeing, printing, bleaching, and finishing of cloths; in grain grinding mills. In glassworks the smelters and glassmakers with their assistants are permitted, owing to special conditions, to work a maximum of 84 hours a week, or 12 hours daily average.

When it is realised that this permanent extension of the legal day to 12 in so many textile factories does not exclude a further application of exceptional overtime it will be seen that the provision for extending protection as to hours to male adult workers is after all little more than the expression of a principle in Austria, and that women and young persons are very far from being protected in the same sense as they are in English textile factories, although it should be noted that their hours so far were better than those legal in many English non-textile industries up till the end of 1895. A ministerial circular, of the same date as the order, lays down the principle that industrial authorities of first instance may grant an exceptional extension at the rate of only one hour a day (for one period of three weeks in the year) to the factories working the 12 hours' pay, whereas they may grant two hours to the factories working an 11 hours' day. A similar limitation is attached to the power of the political provincial authorities to permit overtime under extraordinary conditions, but it should be noted that these authorities may treble the number of nights for overtime if need be. Their power is in no case to be exercised, however, without the consent of the inspector

for the district. It was declared by a ministerial circular, January 4th 1886, that in a factory comprising perfectly distinct branches of industry, such as weaving, spinning, dyeing, printing, &c., each branch might be granted a distinct permit for overtime, but that within the limits of any branch no distinction could be made between separate groups of workers, overtime worked by one is the same as overtime worked by all.*

Night work is permitted for "young workers" (*jugendliche Arbeiter*) over 14 years by a ministerial order of May 27th 1885, in the following cases:—1. For male young persons employed as assistants to the firemen in the scythe-making industry, where work is carried on in shifts. 2. For young persons of both sexes during the months of June and July in the silk-throwing industry, where for climatic reasons it is customary to rest for several hours at mid-day, and begin work early in the morning and carry it on after 8 p.m. The 11 hours' limit must still be maintained. 3. In public-houses and inns boys may be employed as waiters between 8 p.m. and midnight. These exceptions are ordered under Section 95 of the Code. Another order of the same date lays down the exceptions permitted for women and young persons in factories by Section 96b. These may be conveniently tabulated as follows:—

Industries.	Persons.	Night Work.
1. Iron works - -	Boys over 14 - -	In regular shifts.
2. Glass works - -	" "	In certain branches.
3. Flock and feather cleaning.	Women over 16 - -	
4. Machine-made lace - -	," , " - -	Setting bobbins in the carriages where regular shifts are organised.
5. Fatty products - -	," , " - -	Until 10 p.m., if the 11 hours' limit is not exceeded.
6. Paper-making and rag grinding (<i>Halbzeug-fabrikation</i>).	Young persons over 14 and women.	In factories working continuously.
7. Raw sugar factories and refineries.	," , " - -	" "
8. Preserve making - -	," , " - -	
9. The following branches of the textile industry : silk and silk-waste spinning, woollen and cotton and cotton-waste spinning, flax spinning, thread mills, finishing of cotton and woollen cloth.	," , " - -	In double night shifts, or where certain processes are occasionally necessary at night, i.e., between 8 p.m. and 5 a.m.

In the cases when overtime, which has been granted either by the industrial authority of first instance or the provincial authority, extends beyond 8 p.m., young persons over 14 and women employed in the process concerned may, in addition to the above-named instances, be employed so far at night as the permit extends.†

* Compendium über Gewerbeleben, pp. 205-9.

† *Ibid*, pp. 211-12.

The number of permits for overtime was in the view of the chief inspector considerable during the year 1894-95, and may be seen by the following table :—

Industries.	Permits.	Number of Factories, &c., Working Overtime.	Workers concerned.
Textile Industry	359	246	32,231
Engineering	113	76	12,481
Forges and Foundries	63	48	2,381
Printing Industries	55	38	1,486
Clothing	46	31	2,686
Wood	38	30	1,302
Paper	27	20	1,302
Food	22	19	1,162
Chemical	15	14	406
Earthenware and Glass Industries	12	9	750
Leather	8	8	406
Building	5	3	79
Commerce and Transport	2	1	8

More than half the number of workers employed overtime were so employed in Bohemia, numbering 24,884, as compared with 10,067 in Lower Austria, and 9,968 in Moravia while the amount of overtime in other parts of the Empire is comparatively insignificant. It would be interesting if the statistics further showed the actual number of days on which these workers were employed overtime.

The conclusions of the chief inspector are weighty on this question. He states that a comparison of the registers of permits for different years reveals the fact that it is almost, without exception, the same firms who make the application year by year, whilst other firms in the same industry find the maximum 11 hours' day sufficient. "Although it is true that conditions are generally made the basis of a claim for overtime which may not always arise at the same time in all establishments of a given industry, it may yet be observed that a close examination of the conditions urged by the firms making a claim to overtime leads to a conviction that these conditions do not afford a real justification for the exception.

"An example may be cited in the allegation made in many weaving sheds that the preparatory departments are not meeting the needs of the weavers. The moment this want of correspondence is discovered it becomes the duty of the employer to extend the preparatory departments, as he otherwise cannot conform to the legal provision for an 11 hours' maximum day; for overtime is by hypothesis an exception, whereas the employers, by a recurring demand for it, turn it into a rule." This objection cannot, in the opinion of Dr. Migerka, be urged against the case of purely season industries, or industries subject to special season pressure; in these it would be more natural for the employer to temporarily increase the number of workers than to extend the basis of his factory, while it is not always possible for him to obtain the extra workers at need. Cases are shown as occurring, however, by the inspectors, in which employers make use of the permit weeks or months after the time of application, a practice which is manifestly contrary to the spirit of the regulations. The claim or request for overtime is thus transformed into a mere notification to the authorities.

" How little this procedure harmonises with the law may be seen by
 " the fifth sub-section of Section 96a of the Code, which lays down that a
 " mere notification suffices only where there is urgent need (*nur im Falle*
 " *zwingender Notwendigkeit*), and then at most for three days in a
 " month." Such comments as these afford a valuable opportunity for
 estimating the real bearing and spirit of the differences between the
 English and Austrian regulation of overtime.*

It may be noted that during the year 1894-5, out of 1,965 infringements of the Code notified to industrial authorities, only 119 related to illegal overtime; 29 infringements related to employment of women and young workers at night in addition to these.†

8. *Fines and Deductions.—Workmen's Committees.*

The general provisions against truck in the Austrian Code have a similar bearing to those in the German Industrial Code, covering out-workers of every description, and it is proposed here merely to refer any inquirer for a further account to the full treatment of the subject given in the Report to the Royal Commission on Labour.‡

The system for restraining abuses in connection with the power of the employer to levy fines and deductions on the wage-paid worker has also a similarity to the German system.

The working rules affixed in all workplaces where not less than 20 workers are employed must contain a provision as to the nature and amount of fines and deductions from wages and the mode of applying the sums gathered in this way.

In any case, if fines are inflicted on workers, a register of the same must be kept affixed and be open to the inspection of the authorities (G.O., Section 90).

During the year 1894, 49 cases of illegal deductions from wages were reported by the inspectors to the industrial authorities. Some of them bear a resemblance to deductions complained of by English workers, against which their legal remedy is quite uncertain under the Truck Acts, e.g., stoppages for light supplied in weaving sheds in the Pilsen, Brünn, Olmütz, Troppau, and other districts; deductions for alleged damages in weaving sheds in the Graz, Budweis, and other districts; for the keeping in repair of an entrance to a saw-works in the Lemberg district; for alteration of real rates of wages or setting on of workers to a less remunerative piece of work after entering on a new period as to notice (*Kündigungsfrist*) in the Graz and Reichenberg districts.

The inspector in the Olmütz district, who found himself compelled to interfere in many cases for illegal deductions on account of goods or spirituous liquors supplied, draws attention to an insidious form of evasion of the law by the employers in the so-called premium system. He remarks that a provision, to be found in the working rules in these cases, " that every worker who continues a whole season in the business shall receive at the end a premium on each day or piece of work, makes an impression upon the uninitiated that it is a humane provision. Really, the wording of this provision should be that on every payment of wages a certain proportion is held back as a caution to be paid over at the end of the season. The 'caution' of those workers who leave before the end is so much to the gain of the employer.

* Bericht der K.K. Gewerbe Inspectoren, p. 16.

† *Ibid.*, p. 7.

‡ Royal Commission on Labour. Foreign Reports, Vol. IX, 1894, p. 47.

" The worker does not reckon with this factor in entering on the engagement ; having the intention of staying as long as possible in the work, it appears all one to him under what name he receives his wage, and he reckons this premium as part of his wage. Hence arise many complaints when the workers leave before the specified time." As another inspector remarks, " the real effect of this practice is to render the right of a worker to leave at eight days' notice an illusory one," although the employer still retains his right to dismiss the worker. " In a flax-spinning works, where it was the custom to withhold one florin as a caution on each worker, the practice was stopped at our demand. This custom was intended to fix the worker for at least a year at the works . . . The most peculiar form of remuneration we found in a large linen factory. There two foremen received no regular wage, but were paid out of the proceeds of deductions for damaged pieces. The deductions were calculated on so high a scale that they were described by the foremen themselves as unjust. The termination of this abuse by the firm was ordered by us."*

The inspector in the Königgrätz district draws attention to a custom which led in one case to a strike : " It is well known that for piece-work in weaving sheds a certain rate is paid for a certain length. It always happens that the piece comes off the loom either longer or shorter than the specified length. A deduction is made, as the workers affirm, for the shorter pieces, but for the longer no sum is added." In a case taken by the inspector, the firm was ordered to pay back sums deducted in the manner indicated at once to the workers.

A somewhat similar case was found in another weaving shed. " The firm distinguished between *useable* and *perfect* pieces. A certain proportion of the normal wage was indicated as *premium*, and this *premium* was only to be paid to the weavers bringing *perfect* pieces. For *useable* goods a regular deduction was made, or, in other words, the wage was paid minus the premium. On inspection it was found that in 18 days one-third of the workers were affected by these deductions."†

The prescribed register of disciplinary fines appears to be generally established, but cases are not wanting of neglect to keep it regularly. In Reichenberg district, for example, the inspector observed 17 cases of irregularity in the year. Not many cases are found of excessive fines of this kind, a fact which points to the value, on the whole, of the check exercised by the method of publicity.

Wherever workmen's committees have been formed, the chief inspector remarks, they have given satisfaction both to employers and workers. Out of the factories where they exist, the inspector for Wiener-Neustadt affirms, come no complaints to the inspector ; unfortunately, he points out, only 14 such committees exist in his district.‡

9. Sanctions of the Industrial Code.

General provisions.

Infringements of the Code may be punished—(a) by caution ; (b) by fine not exceeding 400 florins; § (c) by imprisonment up to three months ; (d) by temporary or permanent withdrawal of the right to carry on an industry (G.O., Section 131). Two or more of these forms

* Berichte der K. K. Gewerbe Inspectoren, pp. 315-6.

† *Ibid.*, p. 263.

‡ *Ibid.*, pp. 21, 84.

§ One florin = about 1s. 2d.

of punishment may not be inflicted for one and the same offence (special decision of the Minister of the Interior, 1885). In the case of juristic persons the punishment must be borne by the representative or the individual actually in fault (*ibid.*, 1876).

In applying a penalty the court must take into consideration not only aggravating and extenuating circumstances, but also the amount of advantage the offender might expect to draw from the offence, and the amount of harm that might be expected from the infringement (G.O., Section 134).

Except in particularly aggravated cases, or where they are unable to pay fines, employers are to be punished by fines instead of imprisonment. Where they are unable to pay, one day's imprisonment equals five florins fine (G.O., Section 135).

A fine of not less than five florins and not exceeding 200 florins is applicable in the following cases :— Special penalties.

- (a.) Where an industry has been entered on without prescribed notification to the authority or without a prescribed form of concession.
- (b.) Where an occupier continues to carry on his works after an order to cease.
- (c.) Where an industry is carried on without a prescribed form of authorisation.

A fine of not less than 10 florins and not exceeding 400 florins is applicable :—

- (a.) To persons engaging, employing, or treating workers and apprentices in any way contrary to the provisions of the code.
- (b.) To certain classes of tradesmen (named in Section 53 of the code), such as bakers and butchers, who cease their production without a prescribed notice beforehand to the authorities.
- (c.) To those occupiers who misuse their title by concealing an unauthorised business of another person.
- (d.) To those employers who inflict hardship upon their workers by payment in kind, or by any other illegal dealings. (G.O., Sections 132, 133.)

The right of engaging apprentices may be temporarily or permanently withdrawn (in addition to infliction of further penalties under this code or the penal laws), in the case of employers who have transgressed the laws for the protection of young workers and children in such a way as to render it undesirable that they should continue to employ them (G.O., Section 137).

The right of carrying on an industry may be withdrawn for various serious offences, such as would disqualify for obtaining a concession or a certificate of authorisation;* it may also be withdrawn after repeated convictions under the provisions as to employment of protected persons, regulations against truck, &c. in the industrial code, and, further, in case of continued neglect of the conditions of carrying on a conceded industry in face of repeated written warnings (G.O., Section 138).

Where the care of a business is entrusted to a manager the latter may be proceeded against, in case of infringements, instead of the owner, but the owner would be responsible for fines in default of the manager. If the offence committed by the manager is of a kind entailing withdrawal of a title to carry on the industry the employer is only held jointly responsible if he knew of the offence and could have hindered it (Section 139).

* See G.O., Section 5.

Proceedings must be taken within six months unless the offence has been repeated within that period (Section 140).

A higher authority has always the power to reduce the amount of a penalty, or to remit it on sufficient grounds; no appeal can be made from a sentence confirmed or reduced by the next higher court (Sections 149, 150).

The right of the chief inspector to take part in a decision on any case brought before the Minister of the Interior, the authority of third and last instance, has already been referred to (*supra*, p. 193). The proceeds of fines inflicted are to be paid into guild funds, if the offender belongs to one, but if not, to the poor funds of the district to which he belongs (Section 151).

Notices were sent by the inspectors to the industrial authorities of infringements or irregularities found in factories in 1,965 cases, and, so far as the results were made known at the time of their reporting, fines were inflicted in 779 cases, and offenders cautioned in 18 cases. Twenty-seven cases of hindrance or obstruction of officials were reported during the year 1894. The inspectors appealed from decisions in 14 cases, and 12 of these were appeals from the Court of second instance. Some of the penalties inflicted for infringement of the sections relating to employment of women and children were exemplary, e.g., the inspector for Wiener-Neustadt reports on cases where fines of 100 florins, 250 florins, 300 florins, and 400 florins were inflicted.*

A very widespread readiness on the part of the workers to appeal to the inspectors in case of grievances or complaints, appears in the different reports and the range of these communications covers the whole ground of the Industrial Code. It is extremely interesting to observe the development of this side of the Austrian inspectors' work, but it is impossible here to do more than refer to their reports, merely mentioning the fact that 5,817 applications were made to the inspectors by workers in the course of the year 1894.

One particularly interesting case, however, may be cited from the report of the inspector for Olmütz. A maltster had brought to him a complaint of an infringement of the provision as to the 11-hours' day in the works where he was employed. The inspector found on inquiry that the complaint was justified in spite of an attempt by the manager to conceal the fact by false evidence. On the information of the inspector a conviction was obtained, and the firm was fined 100 florins, while the manager was fined 10 florins for obstruction. The maltster was discharged, with threats from the manager as to his chances of finding employment in any other brewery of the district. "As a matter of fact," concludes the inspector, "he subsequently found himself unable to obtain employment in the breweries."†

In conclusion I may remark on two points in connection with this brief summary of the more important Austrian Labour Laws. It is even briefer than the preceding summary of the German laws, for the two-fold reason that the materials gathered have been less complete and the time for dealing with them has been far shorter. Some of the most important features of Austrian industrial legislation and administration must remain over for fuller treatment on some other occasion. The second point, which it is perhaps unnecessary to emphasise, is, that it is only to the Cis-Leithan part of the Austro-Hungarian Empire that the

* Bericht der K.K. Gewerbe Inspectoren, p. 69.

† *Ibid.*, p. 229.

summary refers. The very interesting and distinct system of the Kingdom of Hungary must also remain untouched until some other opportunity.

ADELAIDE M. ANDERSON.

Report on an OFFICIAL VISIT to the AMSTERDAM "MUSEUM
" for the PREVENTION of ACCIDENTS and DISEASES in
" FACTORIES and WORKSHOPS," by Mr. E. GOULD, H.M.
Superintending Inspector of Factories, and Mr. C. R.
PENDOCK, H.M. Inspector of Factories.

One of the most important matters which H.M. Inspectors have to consider is the best means of fencing machinery so as to save life and limbs. A museum of inventions having that end in view having been established at Amsterdam, the above gentlemen were requested by you to visit the place and ascertain if any useful information could be obtained which would be of practical service in this country, and they have given me the following interesting report:—

" As the result of communications which had passed between the Home and Foreign Offices, Her Britannic Majesty's Minister at the Hague, and the Minister of Works in Holland, I received instructions to pay an official visit to Amsterdam in November last, with the object of seeing, and reporting on, the "Museum for the Prevention of Accidents and Diseases in Factories and Workshops," which had been established in that city.

" Mr. Pendock, one of H.M. Inspectors of Factories, was authorised to accompany me, in order that, if no objections were raised, his skill in machinery-drawing should be utilised in obtaining sketches of any novelties in the shape of 'fencing,' or of any exhibits of unusual interest which might present themselves.

" I may say at once, that every possible facility was granted him by the executive council (even to the extent of admitting us on a day on which the museum is closed to the public), who, one and all, did their utmost to render our visit both interesting and agreeable; and who took the greatest trouble to illustrate for our benefit the working of the various new inventions, which they had in position; more, however, of these later. At present, it may be convenient to give a brief history of the origin and development of the present exhibition.

" The Hague is the head quarters of a society having affiliated branches in the principal towns of Holland, which has for its object the promotion of technical industry in the Netherlands.

" An important section of this society is that of Amsterdam, of which Mynheer Landré, principal partner in the house of Landré and Glinderman, is president. In 1889 this gentleman conceived the idea of bringing together in one building the best procurable examples of appliances for the protection of operatives in factories from accidents when working on dangerous machinery, as well as from the risks incident to such as are engaged in unhealthy industries.

" In 1891 the idea took practical shape. A committee was formed, and it was determined to found a museum, wherein the master as well as the operative would be able to study the best appliances for preserving the latter from the dangers to which he is exposed in his daily work.

"In 1892, the Burgomaster of Amsterdam gave a site, rent free, for the exhibition of inventions bearing on this special object; the State undertook to provide an annual subsidy of 5,000 florins, (say 400*l.*). Various societies and private individuals contributed to the good work; some gave money, others, models of machines, &c. All connected with the undertaking worked with enthusiasm.

"During this year (1892) the buildings were put up and arranged for the reception of the stock of machinery, patterns of fencing, life-protecting apparatus, &c., &c., which the society had acquired. Many of these, as has been said, being gifts from friends and well-wishers; but all whether bought or presented, had been selected with scrupulous care by the committee.

"In January 1893 the museum was opened under very favourable auspices and distinguished official patronage.

"Its administration consists (1) of the honorary president, M. Vening-Meinesz, Burgomaster of Amsterdam; and of honorary members, including several past and present ministers and royal commissioners; (2) of the executive committee, of which the president is Dr. J. Forster, Professor of Hygiene at the University of Amsterdam; the vice-president, M. H. W. E. Struve, Inspector of Factories; M. J. D. Landré (above-mentioned), Treasurer; Dr. R. H. Saltet, Director of the Health Service of Amsterdam, Secretary; and many other gentlemen personally interested in, and connected with, industrial questions.

"The charge of the museum itself, of the machinery and models, the general direction and arrangements of details, is entrusted to M. Van Etten, the "the Civil Engineer in charge of the Museum," who is devoted, heart and soul, to the work.

"The building is situated on the Groene Burgwal, No. 44, Amsterdam.

"The exhibition rooms contain a superficial area of about 400 square yards, and a capacity of about 2,000 cubic yards.

"A gas engine of six horse-power, and an electro-motor of one horse-power, transmit to some 22 yards of line shafting (in three sections) the power necessary to keep the different machines in motion.

"The exhibition is open to the public, free, on Monday, Tuesday, Wednesday, and Thursday, from 10 a.m. to 4 p.m., and on the first and third Sundays of every month from 1 to 4 p.m., in order to suit the convenience of artisans and others, whose time is occupied on the ordinary working days.

"On the days when the museum is open, M. Van Etten is always on the spot, ready to give information and explanation to all comers as to the models and apparatus under his charge.

"The objects exhibited, some 300 in number, are distributed among four galleries.

"The upper floor consists of the library, containing a number of works bearing on the special object of the society, *i.e.*, the prevention of accidents and diseases; a workroom, on half-size scale, containing models of various methods of ventilating, warming, and lighting buildings and rooms.

"A large gallery, containing models of various accident-preventing appliances on a small scale.

"Two galleries, fitted with all sorts of machines of full size, in working order, the danger portions of which are all supplied with safety guards of various patterns.

"Thus, then, the museum, which had but a modest origin, has by this time developed into an important and valuable centre of information on matters touching the well-being of the industrial classes. It is still growing, still advancing on the same lines. The Amsterdam Committee

is in constant correspondence with inventors, patentees, and machinery manufacturers, in Paris, Berlin, Vienna, Leipsic, Magdeburg, and many other large industrial centres, many of whom, if they do not present models of their inventions, at all events sell them at a reduced price, to assist in carrying out the society's object.

" In this connection, I was informed that a great many English manufacturers and others had been approached by the Committee, not necessarily with the idea that they would send contributions or give specimens of their inventions, but in hope of acquiring information, and possibly either on loan or by purchase, obtain safety appliances or articles for exhibition.

" I enclose a copy of the letter sent :—

" " Museum of Appliances for the Prevention of Accidents and Diseases
in Factories and Workshops,
" " Amsterdam, 1892.

" " SIR,

" " THE undersigned beg to inform you that they have undertaken to establish in Amsterdam a *Museum of Appliances for promoting the safety and health in factories and workshops*.

" " Pecuniary assistance has already been obtained from the central government and from some private persons, whilst the local government of Amsterdam and the provincial government of North Holland have also been applied to for assistance.

" " The object is to establish a museum on a practical basis, forming a permanent exhibition, where ocular demonstration can be given of the best methods of arranging machinery with a view of preventing accidents to workmen and others, so as to afford the opportunity both to employer and workman of appreciating the advantages and difficulties connected with the matter.

" " Models of complete works arranged from the point of view of health and safety should also be exhibited, as likewise documents and drawings referring thereto. Installations should also be shown in the Museum or be represented there by models or drawings, which aim at promoting the health of the workman in his occupation or excluding or diminishing unhealthy surroundings or influences.

" " For this purpose the undersigned request the support and co-operation of all who are willing to further this object and would give or lend to the Museum articles, drawings, books, models, etc. With regard to the latter, the commission guarantees the return of the goods in an undamaged condition and free of expense.

" " The commission would also be pleased to receive descriptions of such articles as might be purchased for exhibition purposes.

" " You are requested kindly to describe what articles you are willing to exhibit or to make your statement on the enclosed form, the early return of which will be considered a favour.

" " Dr. J. FORSTER, Professor of Hygiene at
the University of Amsterdam, President.

H. W. E. STRUVE, Inspector of Labour in
the third district at Haarlem, Vice-President.

A. D. DE MAREZ OYENS, Banker, Member
of the firm Labouchere, Oyens & Co.,
Hon Treasurer.

Dr. R. H. SALTET, Director of the Local Sanitary Service of Amsterdam, Hon. Secretary.
 Dr. P. J. BARNOUW, President of the North Holland Society, "The White Cross."
 J. BLOOKER, Manufacturer, Member of the firm J. and C. Blooker.
 J. H. DE BUSSY, Printer and Publisher.
 J. H. G. FERMAN, Manufacturer, Director of the Dutch Sugar Refinery.
 J. D. LANDRÉ, President of the Amsterdam Branch of the Society for the promotion of Technical Industry in the Netherlands.
 J. REIJNVAAN, Manufacturer, Director of the Steam Flourmills "De Weichsel."
 C. J. J. SCHMITZ, Member of the Executoir Committee of the Amsterdam Branch of the Society for the Promotion of Technical Instruction in the Netherlands.
 W. SPAKLER, Manufacturer, Member of the firm Spakler and Tetterode, Amsterdam.
 Dr. A. J. COHEN STUART, Clerk in the Public Works Department, Municipality of Amsterdam.

"Form of Entry.

"The undersigned

at

is willing to send to the Museum the following articles for the preventions of accidents and diseases in factories and workshops :

measuring	groundspace,	wallspace :
	as a loan.	
	as a gift.	
	on payment of £	.

"Name of the Firm, under which the articles may be exhibited,

"To

Dr. R. H. SALTET,
 Honorary Secretary to the Museum Commission,
 at the Laboratory of Hygiene,
 Kloveniersburgwal 84, Amsterdam (Holland).

"The English manufacturers, however, seem, as a class, to have boycotted the exhibition, and ignored the applications addressed to them.

"To 141 letters sent, M. Van Etten tells me that only two replies were received. At all events I could only discover, out of the total number of specimens on view, *two* of English origin. We now come to a description of some of the more prominent objects of interest which we met with in an exhaustive examination of the museum.

"The exhibition is divided into—

Section 1. Matters connected with hygiene.

Section 2. Appliances for the prevention of machinery accidents.

"The hygienic models are designated by blue paint; fencing of dangerous machinery, &c., is painted red. By this means the discovery of any particular object, in either of the sections, is facilitated, and the visitor's time economised.

"Among the strictly hygienic exhibits (which of course include all matters connected with ventilation, &c.) were noticeable specimens of working clothes for men and women, and appliances for rendering first aid in case of accidents, &c., including a case of surgical instruments, bandages, lint, &c., the idea being to have similar apparatus in every large industrial centre, accessible at any given point, which would be well known to millowners and operatives in the various localities, &c. The hygienic section proper adjoins the small-model gallery. Here we came upon a large collection of respirators of all kinds, as well for protection against noxious fumes as against dust, made of aluminium and cotton wool, of silk and wire gauze, of flannel; also valve respirators; goggles and eye protectors of every variety of pattern. Here were also some clever guards for the revolving cutters of moulding machines; models of circular saw guards; a simple and apparently good method of carrying off the emery dust in the process of sharpening carding cylinders, and an admirable moveable guard for emery wheels; specimens of slabs of glass for flooring of upper passages, &c., inside the thickness of which was cast wire netting in order to prevent the glass fragments falling from above, in the event of breakage (this system is also applied to covering the pipes of water gauges, and appears to be most valuable). Here also were models of safety hoists, one specially for goods, with a moveable iron jamb, which attracted our attention by its simplicity. A new model of an electric brake was also exhibited here.

"The main room below contains the shafting with pulleys and belts by which the motion is carried from the engine (mentioned before) to the various full-sized examples of machines with which the room is filled.

"The shafting, as mentioned in three sections, is fitted with contrivances for immediately detaching any given portion from the rest when running, and also with appliances for putting belts on pulleys, &c., &c. (One of these is a French system worked by an independent dynamo, and another, by a system of cogwheels.)

"Among other matters were, a planing machine with an excellent cover for the cutters; and what looked like a really serviceable guard for a circular saw, that great desideratum (in this connection I may say that all the circular saw guards on view, and of those there were several, whether small models or of full size, had, as a main idea, a back-splitting knife, whatever might be the method of guarding the front of the saw); a model of an arrangement for protecting the hands from laceration when engaged in cleaning the knife of a wool-carding machine; a letterpress printing cylinder machine, having the interior cogs, and outside 'rack' well fenced: there is also fixed to the floor in front of this machine a wooden step, some eight inches high, to prevent a too near approach to the table when 'running out'. It is obvious that one would have liked to have seen many of these contrivances, marvels of ingenuity in themselves, in mills under actual working conditions. (As an example, I may here quote a pretty model of an apparatus for making white lead, in which the material undergoes the various processes, without once coming in contact with the operative's hands.)

"The two lower galleries contained models which did not require to be put in motion by machinery. Among the remaining exhibits which especially attracted our notice, was an admirably designed wooden block in sections, to fit over an iron protruding key, which keeps the pulley in

position on a shaft ; a good rag-sorting and cutting tray with perforations, and a down exhaust for the dust.

"Here was a curious fire escape invented by a watchmaker, consisting of a bag, suspended by a rope working from a circular iron box, within which is the mechanism regulating an outside two-bladed 'wing-fan.' Any one using the apparatus steps into the bag and lowers himself by a guide rope. The speed of the descent is governed by the resistance to the air to the revolving blades of the wing fan. We saw this tested by one of the attendants.

"A simple contrivance for tilting and emptying carboys of sulphuric acid, the carboy being fitted with an india-rubber tap, in the top of which is a valve ; through this the air enters as the acid flows out by the tap mouth, and thus all splashing is prevented. We saw also a good idea for dispersing heavy escapes of free dust, from whatever process arising, consisting in a sort of fire annihilator, into a tube of which water is pumped and thence driven out in a 'pulverised' spray through the dust cloud.

"It would, however, take up too much of your space were I to endeavour to describe, however briefly, more than the few exhibits which I have dealt with, out of such a large number : it must be remembered that the greater part of the inventions represented by models in this museum are actually in use in one or another factory or class of factories on the Continent. But one would have liked, as I have mentioned, to have seen many of the more delicate novelties in practical work in mills, *under ordinary manufacturing conditions*, before venturing to pronounce an opinion on their merits. But, be this as it may, it is certain that the collection has been chosen by highly skilled experts, and is set out with admirable judgment. The promoters of the work, however, are not yet satisfied with their efforts ; they consider the exhibition, admirable as it is, merely as the nucleus of one which shall illustrate far wider fields of industry than those which they have as yet explored. They are determined to leave no stone unturned to make the Amsterdam Museum of life-preserving appliances as complete of its kind as is possible. Every one must wish that success may crown their exertions.

"I desire here to express the extreme kindness and cordiality with which Mr. Pendock and myself were received by the members of the committee of the museum. Our very sincere thanks are due to Professor Forster, to M. Struve, to Dr. Saltet, to M. Landré, to M. Van Etten, the director. These gentlemen met us at the museum on our arrival, and, I fear, at some inconvenience to themselves, devoted themselves to pointing out and explaining the principal objects of interest. M. Van Etten was with us for nearly three whole days ; he spared no pains to demonstrate the value of the more subtle inventions, and to give us the fullest information on all details connected with the museum and its contents.

"One question more remains to be considered, Would it be possible, and, if possible, desirable, to establish a similar museum in London ?

"The answer depends upon the possibility ; as to the desirability, there can be no sort of doubt. Upon the question of finance, which lies at the root of the matter, this is not the place to enter, but it would not be easy to exaggerate the value of a collection in London of life-preserving and accident-preventing appliances, based on the lines of that at Amsterdam. The usefulness of a dépôt wherein all the best and latest inventions for lessening the dangers to which operatives must

necessarily be exposed, can be seen in position, must be evident without any special pleading in its favour.

"An exhibition of patterns and models of fencing for engines, shafts, belts, cogs, saws, &c., of ventilators, fans, and numberless other contrivances for minimising risks of all kinds in dangerous operations, which would be open without payment to every passer by, must eventually tend to emphasise the necessity of adopting precautions whether in respect of hygiene or of dangerous machinery. It would be a boon both to masters and to men, it would keep constantly before the eyes both of employers and of employed the ease and readiness with which simple safeguards can be brought into use, and in time it would go far to diminish the stolid indifference with which, even at the present day, efforts in the direction of diminishing accidents and diseases in factories and workshops are regarded by many of those most interested.

"It is a matter of common knowledge that one of the greatest difficulties in the work of the Inspectors of Factories, viz., that of insisting on precautionary measures arises from the opposition or apathy of the very people whose lives, limbs, and health are constantly exposed to some danger, the existence of which might be obviated by some simple safeguard.

"No one unconnected with the practical administration of the Factory Acts can realise the immense amount of prejudice on the part of operatives which still has to be overcome; it follows then that if the use and simplicity of ordinary precautions were made more familiar to everybody concerned by such a permanent exhibition as that under notice, the way would be paved possibly to something like concerted action in the desired direction.

"There is yet another aspect of the position to be considered.

"Such an institution as that at Amsterdam would contribute no little to the adoption of uniformity in patterns and types of fencing. At present, there constantly exists considerable divergence of opinion, both on the part of practical engineers, and on that of Inspectors of Factories, as to the best methods of guarding dangerous machinery, and as to the best 'appliances for the prevention of accidents;' but in an exhibition wherein none but the most approved models of guards, &c., &c., could be seen, a standard, so to speak, of fencing could be arrived at, which would in time bring about this much to be desired 'uniformity.'

"Every Factory Inspector on appointment passes a month in London before proceeding to the district to which he is to be permanently attached; hence a means of education of the highest value would be provided for every member of the Factory Department, in respect of the latest and best known systems of machinery guards, of ventilation, of the means to preserve health in working, &c., to be met with in Europe.

"The latter ground, no doubt, is partially taken up by the Parkes' Museum of Hygiene, but this is scarcely to be called a central, always accessible, store of apparatus, constantly receiving additions and extensions, such as that under consideration. A museum such as that under notice would be, I repeat, of incalculable advantage to every employer of labour, every millowner, every artisan, inasmuch as, if carried out on principles similar to those which inspired the formation of, and govern the administration of, the Exhibition at Amsterdam, nothing would be shown which, in the opinion of independent experts, is not of high practical value.

"This account of the Amsterdam Museum is illustrated by the examples of some of the smaller novelties drawn, thanks to the ready permission of the executive council, by Mr. Pendock, with full descriptions attached; and also by reduced copies of photographs of some of the larger machines, taken by M. Van Etten, which speak for themselves."

PLATE I.

SAFE and SIMPLE SHAFT COUPLINGS.

Few parts of mill-gearing are more productive of mischief, or more dangerous to life and limb, than flange couplings, of the ordinary pattern which are fastened together by means of bolts, the heads and nuts of which project on either side of the flanges.

Plate I. shows a form of coupling which is simplicity itself, having neither nuts, bolts, flanges, or keys.

Description.—It consists of a barrel-shaped "sleeve" of cast-iron, which is bored internally to the bare diameter of the shaft $S^1 S^2$, and turned on the outside to the shape indicated in the drawing, being gently tapered from the middle towards the edges. This sleeve is then cut into two halves A and B.

The halves A and B are then placed on opposite sides of the joint, and a couple of rings or collars C and D, which are bored to the same degree of taper as the sleeve, are put on at each end, and driven by a mallet towards the middle or greatest diameter, in the same way that hoops are driven on to a cask. This has the effect of bringing the two halves A and B tightly together, with the two ends of shafting S^1 and S^2 held firmly between them, as in a vice, so that one shaft cannot rotate without the other.

The joint can be made still more rigid, if the ends of each shaft are notched as shown by the dotted lines in the sectional view.

PLATE II.

FAST and LOOSE PULLEYS for HIGH-SPEED MACHINES.

Accidents have often been occasioned by the sudden starting of a machine whilst undergoing repairs or adjustment, or, as in the case of a saw or planing machine, whilst sharpening or oiling is being done. This is sometimes caused by the loose pulley (through defective oiling or otherwise) suddenly seizing the main spindle upon which it runs, and causing it to turn round.

Description.—The arrangement shown in Plate II. renders such an occurrence impossible, for instead of the loose pulley A (Fig. 1), being allowed to run on the machine spindle D, it is provided with an independent pin or spindle C, of its own, which is secured to an arm or bracket E by means of a set screw S. The head of this pin or spindle, C prevents the loose pulley A from coming into contact with any part of the fast pulley B, or with the main spindle D. So that whatever happens as between A and its spindle C, no motion can be communicated to B and D, and (provided the belt is kept entirely on A whilst the machine is stopped) the machine is quite as safe for handling as though the belt were altogether removed.

Moreover, as the pulley A rotates on a fixed spindle, instead of a revolving one, much better means can be provided for oiling, preventing

A SAFE AND SIMPLE FORM OF SHAFT COUPLING.

FIG. 1.

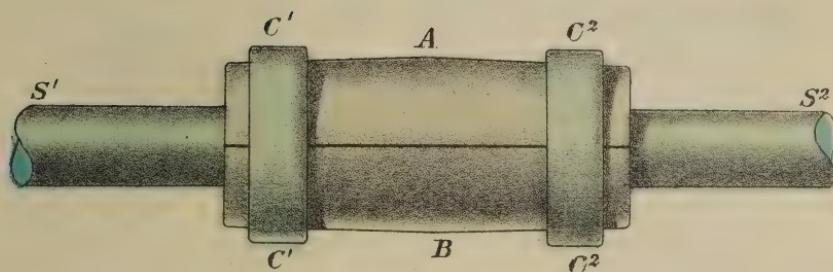
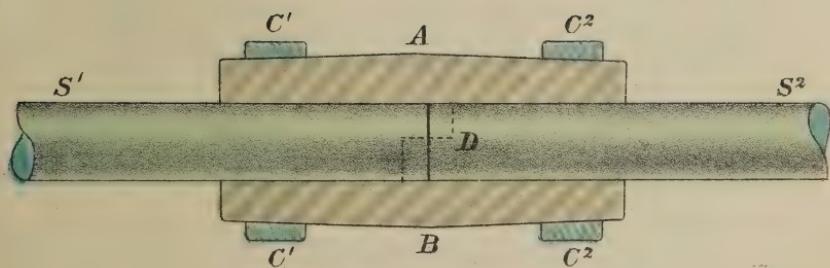


FIG. 2.



SECTIONAL VIEW.

FIG. 1.

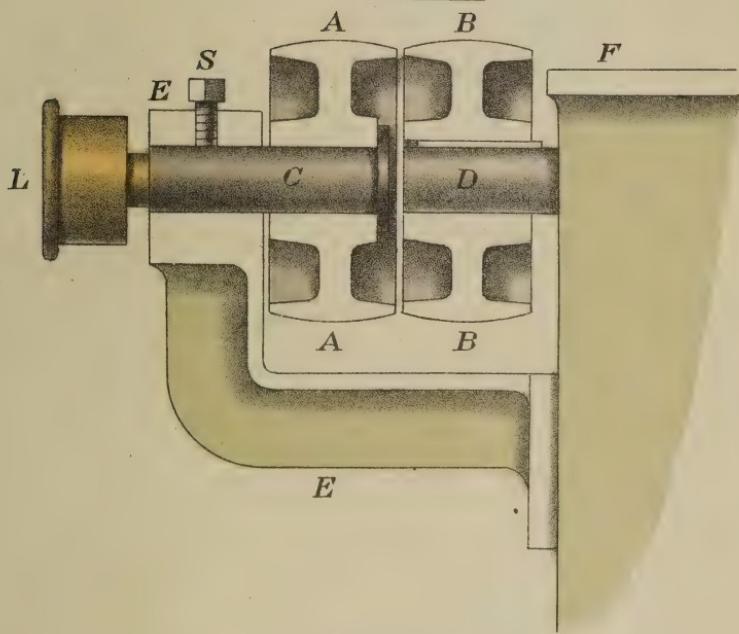
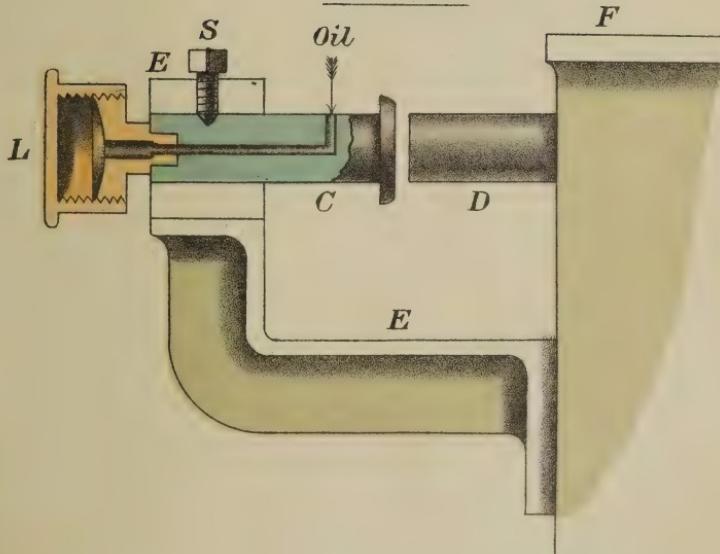


FIG. 2.



SELF OILING PLUMMER BLOCK.

— Scale $\frac{1}{8}$ th full size. —

FIG. I. SECTION THROUGH MIDDLE OF PEDESTAL.

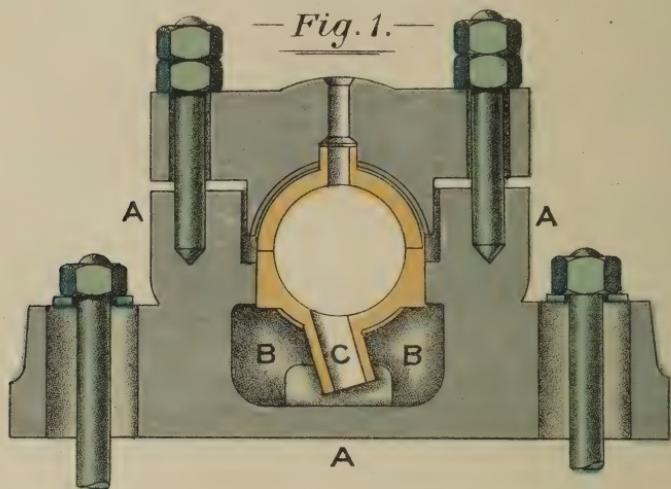
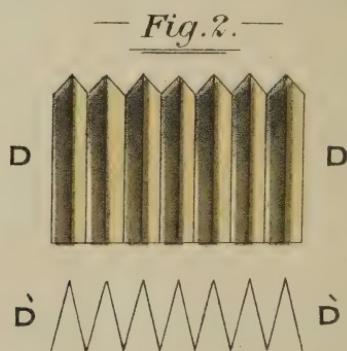


FIG. 2. ENLARGED VIEWS OF METALLIC FEEDER



FIGS. 3 & 4. SECTIONS THROUGH G. M. BEARINGS.

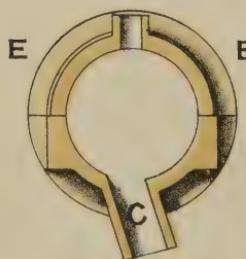


Fig. 3.

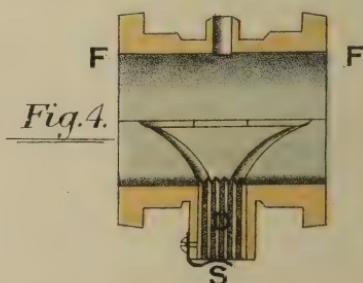


Fig. 4.

Showing grooves in bearing for distributing oil.

— SAFETY “BARRING” APPARATUS.—

FIG. 1.—ELEVATION OF ENGINE
FLYWHEEL AND BARRING GEAR.

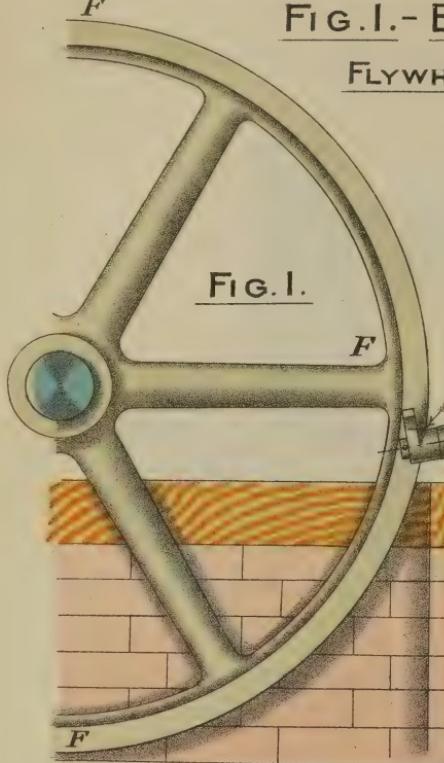
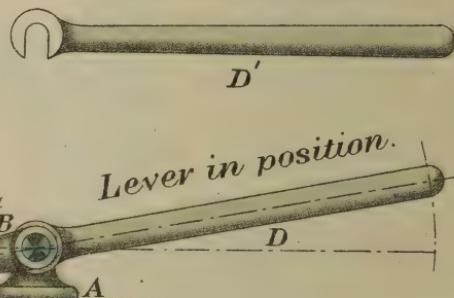


FIG. 1.

Lever-detached.



Lever in position.

FIG. 2.
F

FIG. 2.—Enlarged View
showing front part
of flywheel run, with
eccentrics grippers G.G.
in position for moving
the wheel.

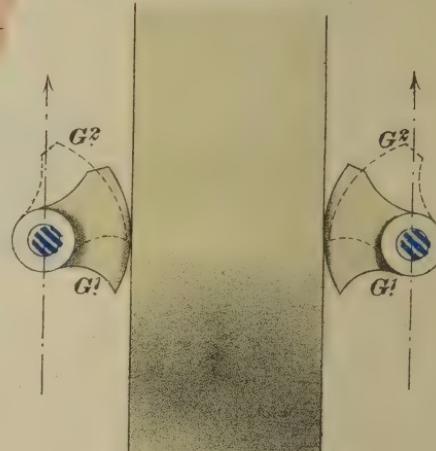


FIG. 3.

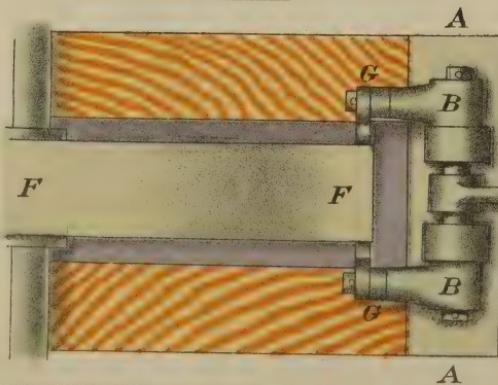


FIG. 3. PLAN.

*Showing arrangement
of levers and eccentrics
in position.*

wear for one thing, and as the spindle C is also detachable, facilitating repairs for another.

In Fig. 2 the lubricant is forced through a hole in the centre of the pin C, by means of a lubricator L, which screws into its outer end.

PLATE III.

SELF-OILING PLUMMER-BLOCK OR PEDESTAL.

This is a device for securing the constant lubrication of all such bearings and parts of machinery as are more or less constantly running in places difficult of access.

Description.—Instead of the ordinary pattern, the pedestal AA. is in this case provided with a cavity BB, beneath and around the gun-metal bearings, which cavity acts as a container for the lubricant (Fig. 1). The bottom bearing has a spout C (Figs. 1 and 3), which dips into the reservoir BB at the angle shown, and this spout or feeder is fitted with a contrivance which supplies oil to the journal by means of capillary attraction, in much the same way that a wick supplies oil to a lamp. It consists of a thin strip of metal, of a width corresponding to the depth of the spout, and folded like a miniature Japanese screen, *see D* and *D¹* (Fig. 2). In these views the folds are exaggerated for the purposes of illustration, but in actual practice the strip is compressed into the spout C in such a manner that the space between each fold is just sufficient to allow the oil to percolate through and no more, *see D* (Fig. 4). The top of each fold is filed to fit the journal (or revolving shaft), with which it is kept in constant contact by the little spring S, pressing upwards.

Grooves cut in the bearing (*see Fig. 4*) act as distributing channels, and the oil, after spreading over the journal and doing its work, drips over the edge of the bearing back into the reservoir BB, to be used over and over again.

It is claimed that this lubricator will run for several months without attention.

PLATE IV.

SAFETY "BARRING" APPARATUS FOR STEAM ENGINES.

In the larger steam engines, having one cylinder only, the engine often stops with the crank in a position from which it must be moved before steam can be applied to give motion to the parts. This is done by various methods of moving the flywheel. Oftentimes the rim of the flywheel is either cogged, notched, or drilled in holes, and the wheel is moved by means of a lever and fulcrum applied to the notches, &c. This process has many objections, one being that it is considered inadvisable to interfere with the smoothness of the rim either by drilling holes or notching. By the above arrangement a perfectly smooth rim can be gripped, and "barred" round as easily as a cogged one.

Description.—It consists of two arms BB (Figs. 1 and 3), keyed to a short spindle, having its bearing on a block AA, and operated by a detachable lever D,D¹. The extremity of each arm BB, carries an eccentric gripper GG, which exactly opposes the other on each side of the rim FF (Fig. 2, G¹G¹). By pressing down the lever D the arms BB are exerted upwards, and the eccentric form of the grippers GG causes them to tightly seize the rim and force it round for a few inches in an upward direction. When the lever D is lifted to obtain another

purchase, the eccentrics fly open as shown by the dotted lines G² G (Fig. 2), and the arms drop freely for a fresh "bite." This action is repeated until the wheel is in the required position for starting, when the eccentrics can be thrown over out of the way, and the lever D detached.

It will be seen that if steam should be applied, and the wheel begin to rotate, the grippers would instantly release themselves, and no harm would ensue to the operative.

PLATE V.

SELF-CLOSING SHUTTER for WILLOWING or RAG-TEARING MACHINE.

The attendants of these machines are often injured by putting their hands into the revolving teeth or spikes when feeding.

Description.—By this arrangement it is almost impossible for them to do so, the mouth, or hopper, M, of the machine being provided with a false shutter B, inside the ordinary door or cover A, so arranged that either the one or the other must be closed whilst the other is open. For instance, the attendant puts a layer of material upon the door A when it is in the open position shown in Fig. 1, the shutter B being then closed to shield the teeth on the barrel K. To push the material into the machine he closes the door A by lifting it into the position shown in Fig. 2; and as he does so the inner shutter B is automatically raised to the top, allowing a free passage of the material in towards the teeth. This is done by means of the curved links CC, acting upon the lever D, and which in its turn is connected to the shutter B, which slides up and down like a sluice valve in the grooves FF; the whole arrangement being nicely balanced by the weight G.

It will be seen that as the result of this ingenious combination of doors, links, and levers, the attendant is absolutely protected from danger so long as he keeps the door A either *perfectly* open or shut: the only possible chance of his getting his hand into the teeth, being when the door A (and consequently the shutter B) is in *mid-position*.

PLATE VI.

SELF-ADJUSTING GUARD for KNIVES of WOOD-PLANING MACHINE.

These machines are admittedly dangerous, and difficult to fence, but the arrangement here shown appears to practically overcome most of the difficulties experienced in this way.

Description.—It consist of a bracket AB, having two sockets BB, in which two parallel sliding pins are fitted, which together with cap C, and a cross-bar H beneath, form a sort of frame which can be moved up or down as required, being just sufficiently balanced by the weight M, to rise without difficulty, and to descend of its own accord. The guard proper, D, is a piece of corrugated sheet-iron, of the form shown, having a knob at the outer end, by which it can be pushed in or out through the cap C, to meet the thickness of any piece of wood which, like F, has to be planed on its edge.

It appears possible by this guard to cover all parts of the knives which are not in actual use, when any kind of flat planing is being done, and pieces of wood which, from being too short or otherwise, cannot be planed whilst this guard is in use, should never be planed on this machine at all.

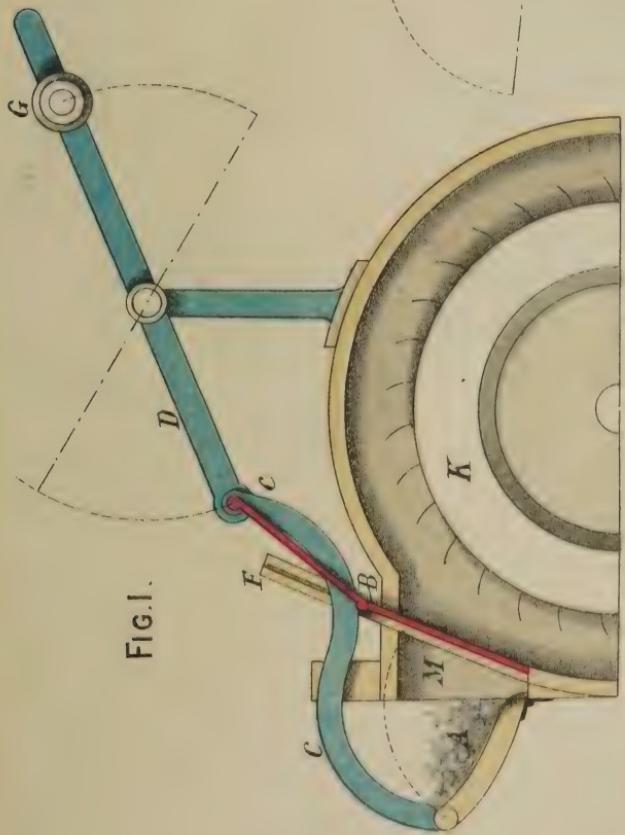


FIG. 1.

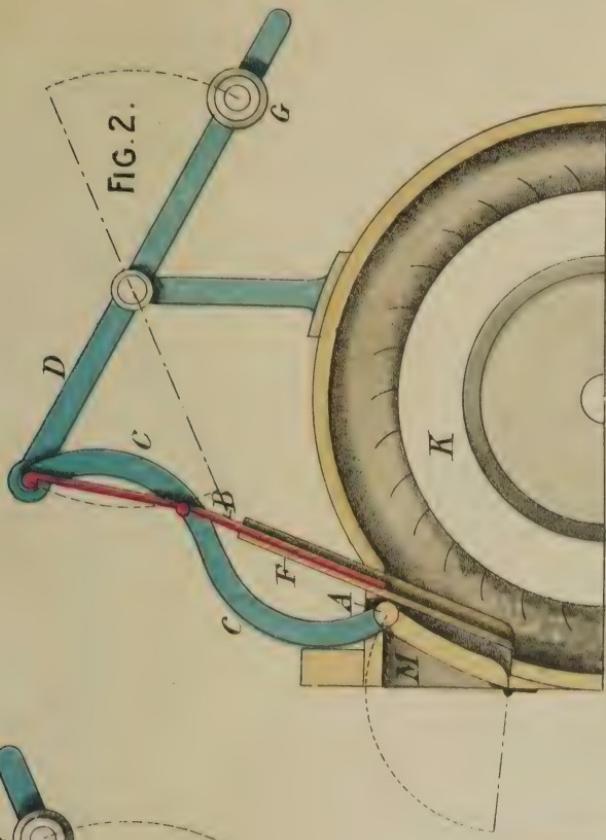


FIG. 2.

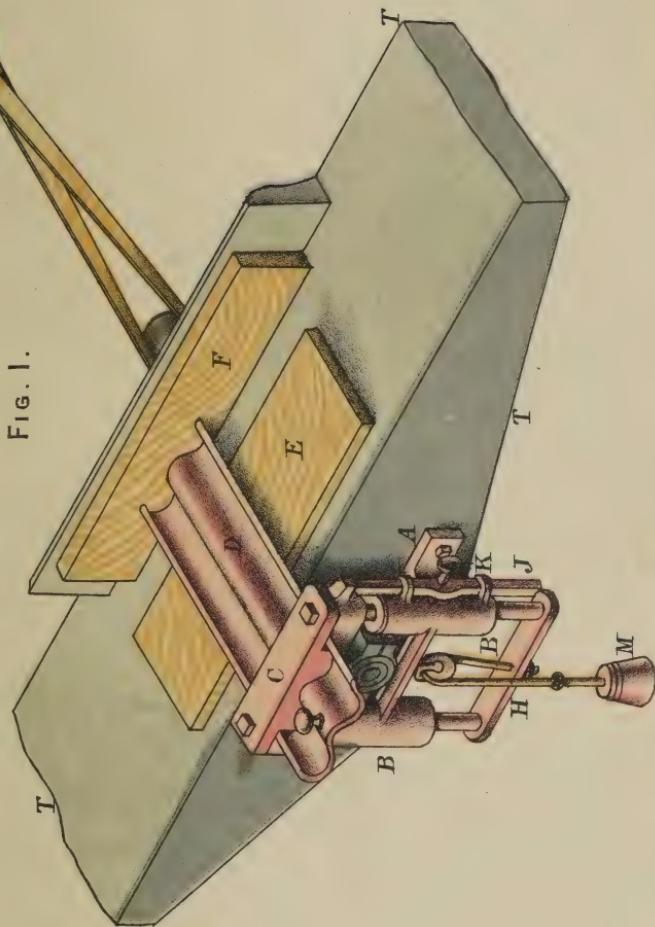
Fig. 1. Shows Door A open for filling, and Safety-Shutter B closed down to shield teeth

Fig. 2. Shows Door A closed and Shutter B open, admitting passage of material to teeth.

Sectional Diagrams Showing Arrangement of Self-closing Shutter for Willowing or Rag-tearing Machine; for preventing the hands of Attendant from coming in contact with the revolving teeth.

SELF ADJUSTING GUARD FOR KNIVES OF WOOD-PLANING
MACHINE.

FIG. 1.



Note.—The Guard and its Attachments are distinguished by the Crimson Colouring.

RIGGER-GUARD OR STRIKING GEAR.

FITTED WITH KEY AND
LOCKING LEVER.

FIG. I.

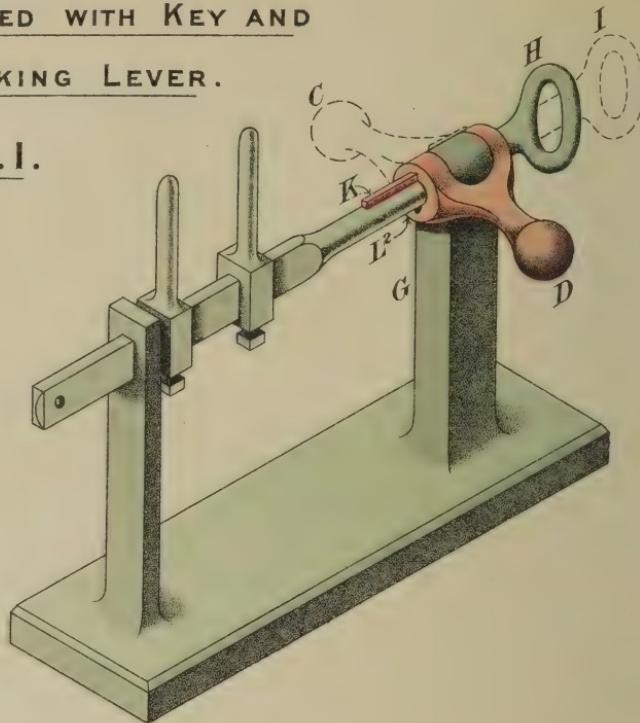
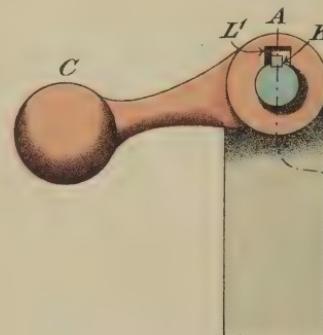


FIG. I. GENERAL VIEW.

FIG. 2.



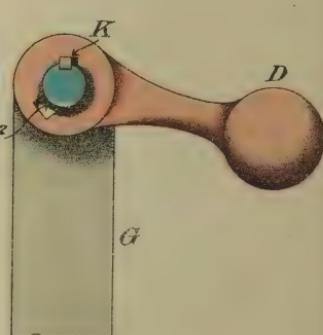
POSITION AT C.
(Keyway open.)

FIG. 3.



SECTION ON A.B.
(Keyway open.)

FIG. 4.



POSITION AT D.
(Keyway closed.)

The guard, when necessary, can be fixed for any thickness of wood by means of a bolt J, at the side, which is regulated by a hand-screw K.

PLATE VII.

RIGGER-GUARD OR STRIKING GEAR, fitted with LOCKING LEVER.

This is an arrangement for preventing a belt from shifting from the loose pulley to the fast one, or *vice versa*, when once it has been set.

Description.—A horizontal sliding bar carries the belt-fork at one end, and terminates in a handle H at the other. For about a foot from this handle the bar is rounded off so as to pass through a hole in the head of the standard G at a sliding fit. A flat key (or feather) K is fitted tightly into the top of this part of the shaft, and it is kept uppermost by the flat part of the bar, which prevents its turning. A forked and weighed lever D fits over the head of the standard G, and being bored to the same diameter, it is made to turn over on the round part of the bar, either from D to C or *vice versa*, so that the slot L² (Fig. 1), which is cut through one side of the fork D, may be either brought opposite to the key K, as in L¹ (Fig. 2), or be thrown underneath as at L² (Figs. 1 and 4).

In Fig. 1 the belt is supposed to be on the loose pulley, from which position it cannot be moved, because the fork of D opposes the passage of the key K into the head of standard G (Fig. 1). If, however, the forked-lever D be turned over to the position C, the slot L² (Figs. 1 and 4), is brought opposite to the key K, *see L¹* (Figs. 2 and 3). This slot affords a ready passage for the key, into a corresponding slot in the head of G, so that the handle H can be moved to the position I, and the belt thus moved to the fast pulley. By turning the lever C back again to D, the key K is secured in the head of G between the two halves of the fork.

It will therefore be seen, that whether the belt be on the fast or loose pulley, it cannot be moved from either position, so long as the forked-lever is in the position D.

PLATE VIII.

METHOD OF KEYING A PULLEY ON A SHAFT BY MEANS OF AN INTERNAL KEY.

Description.—In place of the ordinary wedge-shaped key, which is driven in longitudinally between a slot in the pulley and a flat on the shaft, in this case a key is used of the shape shown at K (Fig. 3). To receive this key, a core is bored in the boss of the pulley PP, so as to form an annular space between it and the shaft. This space is given a slight eccentricity by the pulley being set a little out of truth in boring, as may be seen from the part section on CD (Fig. 1). (Thus, the space at L is narrower than at K).

In keying on the pulley, the key K is put inside the core at the point where the eccentricity is greatest, in this instance on the uppermost part of the shaft S (*see K*, Figs. 1 and 2). Both pulley and key may then be pushed over the shaft S to the position required, when, by giving the pulley PP about a quarter of a turn in either direction (the shaft remaining still), the key K will become wedged in a narrow part of

the space, and any motion given to the pulley will be given to the shaft S also. This wedging action is increased by any extra force that may be applied to the pulley in the same direction, but is relieved when the pulley is reversed.

Advantages.—(1.) As no flat is required on the shaft, the pulley may be secured in any position with regard to it; (2.) There is no head or projection of any kind beyond the boss of the pulley; (3.) The key cannot come out.

Disadvantages.—(1.) Can only be used when the pulley transmits force in one direction; (2.) In case of a pulley having been fixed for a considerable time, great difficulty would probably be experienced in disengaging the key in case of its removal being required.

PLATE IX.

ADJUSTABLE GUARD for CIRCULAR SAW.

The guard shown in this plate is one that has the advantages of simplicity combined with efficiency and cheapness.

Description.—It consists of a steel plate the same thickness as the saw teeth, made in the shape, and secured in the position shown at G in the illustration. Its base is bolted to the frame A, beneath the slot in which the saw works; and its inner edge (nearest the teeth) is ground to a moderate degree of sharpness, so as to offer no obstruction to the passage of the sawn wood (such as is represented by D).

The head of this guard G is fitted with a screwed pivot P, which is elongated on each side about two inches beyond the nuts, and upon which is fitted the moveable part of the guard. This consists of two pieces of wood, FF, braced together to form a hinge upon the pivot P, but separated from each other in the lower part by a space of an inch or so, so as not to obscure the view which the operative should have of the teeth.

This arm, FF, is made to lift up or down, according to the thickness of wood to be sawn, but at its lowest, or any position, the outer edge is still beyond the path of the saw teeth, so that a man putting his hand upon it would not be cut.

It will be seen from this:—(1.) That the steel guard G prevents the sawn wood from binding on the teeth nearest it, so that the wood cannot be thrown upwards from this cause; (2.) That, should the wood rise from any other reason, the projecting pins PP would arrest, or considerably diminish its progress; (3.) That a man could not, without difficulty, put himself in danger from the teeth, whilst the guard was in operation.

PLATE X.

CORRUGATED STEEL GUARD for EMERY-WHEEL.

The principal danger in the case of emery-wheels, arises from their tendency to burst when unskillfully made or used, and in the case of the smaller wheels, the difficulty of providing against this danger is not easily overcome; anything like a rigid guard being likely to increase the mischief rather than otherwise. The guard shown in the illustration may perhaps tends to a solution of the difficulty.

METHOD OF KEYING A PULLEY ON A SHAFT BY AN INTERNAL KEY.

FIG. 1. Elevation with Part Section on C.D.

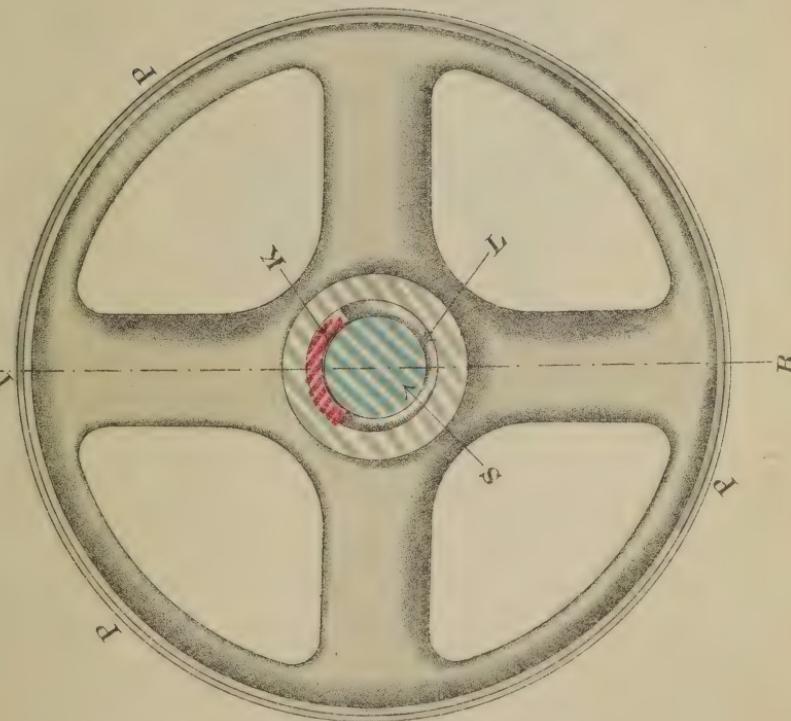


FIG. 2. Section on A.B.

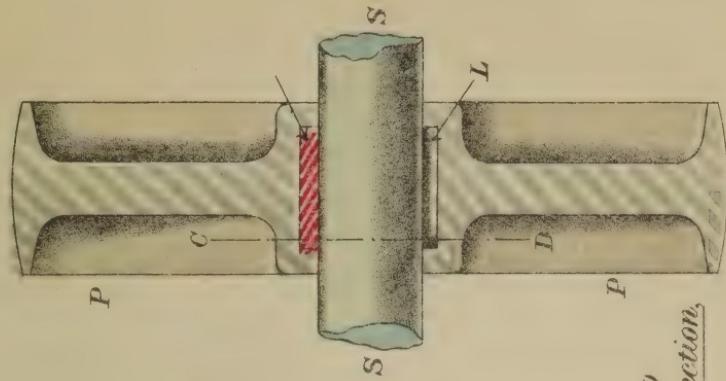
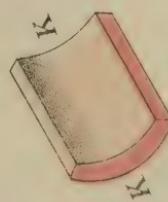
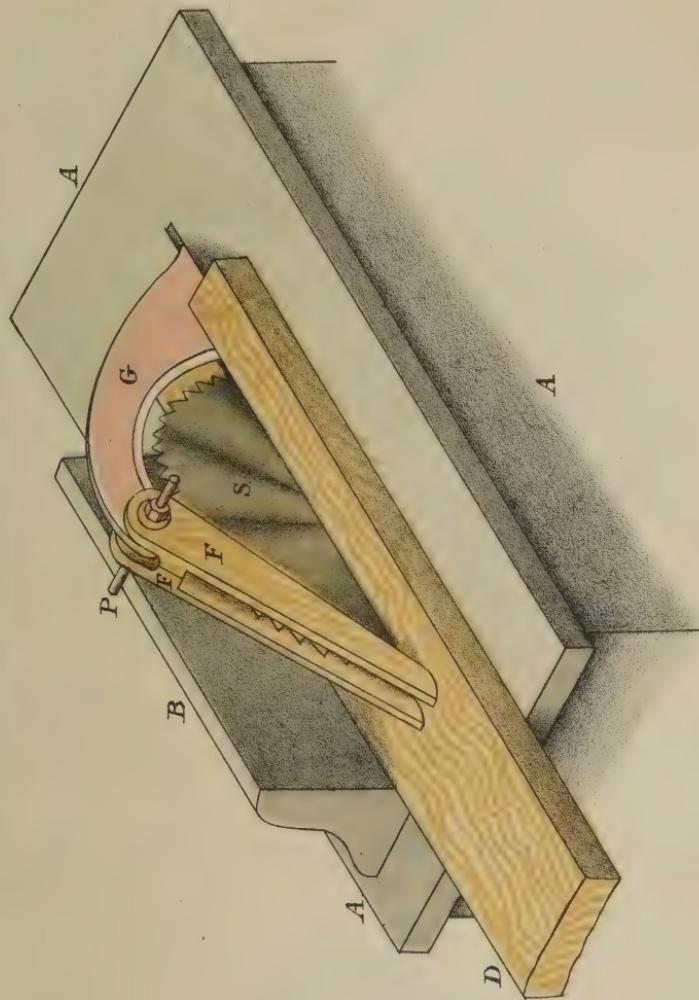


FIG. 3. View showing Form of Key.



This Key, being fixed inside the Boss of Pulley, has no head or dangerous projection, and cannot work out.

ADJUSTABLE GUARD FOR CIRCULAR SAW.



GENERAL VIEW OF GUARD IN OPERATION.

CORRUGATED STEEL GUARD FOR EMERY WHEEL.

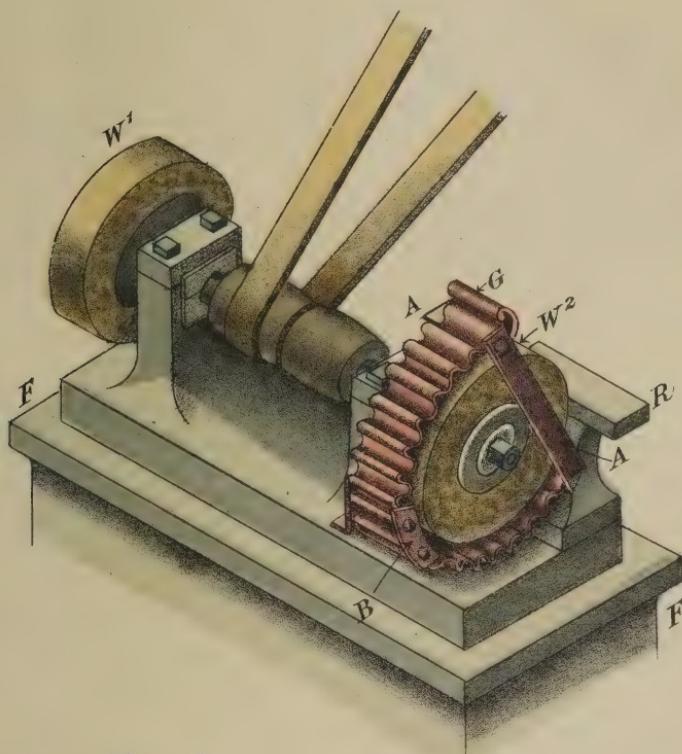
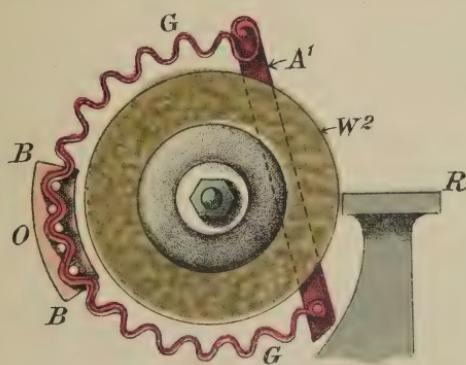


FIG 1.

GENERAL VIEW.

(GUARDS & ATTACHMENTS SHEWN IN CRIMSON.)

FIG 2. ELEVATION OF GUARD & REST.



SHOWING HOW THE TWO HALVES OVERLAP AT O .

Description.—It consists of a corrugated ribbon of mild steel G, which encircles as much as may be necessary of the periphery of the wheel W², and which is secured to the frame F by means of the plates and bolts at A and B (Figs. 1 and 2).

It is claimed for this guard that in the case of the wheel bursting, instead of presenting a rigid resistance to the flying parts, the elastic nature of the guard G together with its tendency to unfold, would serve to gradually arrest the momentum of such flying parts, and if not to immediately check their progress, would certainly diminish the extent and rapidity of their flight.

It will be seen from Fig. 2 that the guard can be made in two halves (top and bottom), and as the wheel wears back, the two halves being made to overlap at O, can be taken up a notch at a time, so as to suit the size of the diminished wheel.

FACTORY LEGISLATION IN INDIA.

I am indebted to the "Dundee Advertiser" for the resolution passed by the Dundee Chamber of Commerce and the reply of the Bengal Chamber of Commerce with reference to this question, which has excited much interest.

The following resolution was passed by the Dundee Chamber of Commerce. They drew attention—

"1. To the injustice of the competition with the home textile industries permitted by the laxity of the Indian factory Act, as regards the long hours during which machinery, operated by women, young persons, and children, may be wrought—22 hours by women and young persons, and 15 hours by children, as against 10 at home.

"2. To the want of adequate and systematic inspection by officials trained and appointed to the work, as required in the United Kingdom, and whether, even if such inspectors were set apart for this work, it would be possible to prevent the intentions of the Legislature as regards the working hours of women and children being exceeded where the shift system is in operation; and

"3. Whether the evils naturally incident to and experienced in this country from the employment of women and young persons during the long hours and of night employment have been sufficiently considered in permitting, under the provisions of the shift system, a new industry so to develop itself. On these grounds the Chamber submits that factories conducted by subjects of the Crown, and equally under the control of Parliament, whether in India or at home, should be subject to similar conditions; particularly that they should not be allowed to employ women, young persons, or children before six in the morning, or after seven at night.

To this resolution the Bengal Chamber of Commerce forwarded a reply, of which the following is the principal passage:—

"Employment of Women and Young Persons."

"The third part of the resolution of the Dundee Chamber betrays so obstinate an ignorance of the working of the manufacturing industries of India as should be fatal to the resolution as a whole. There are no

points of comparison, so far as the committee of this Chamber know, between the employment of women and young persons in the United Kingdom and in India. The idea of such a comparison is simply grotesque. To take one instance only, in India whatever labour is performed is done within the mill premises. There is absolutely no labour at the homes of any section of the labouring community. Taking the first and third parts of the resolution together, the committee find that throughout the Bengal Presidency no woman can ever be wrought 22 hours, and no children 15 hours. Night work is as yet in its infancy, and the natural operation of the shift system will always prevent a stream of labour opposed to the habits of the people, and which no reasonable wage would induce them to undertake. Indeed, all the evidence the committee can gather goes to show that, instead of working for 22 or even 15 hours, women and young persons work for less than 8 hours actually spent in labour in the mill, and that, in addition to having periodical days of rest and holidays throughout the year, they take long periods of leave to an extent and in a manner unknown at home.

"Conditions of Life in Dundee and Bengal."

"The Dundee Chamber assumes that the conditions of life, the character of the labourers' homes, and the associations to which they are subjected are the same in India as in the United Kingdom. That Chamber takes no thought of the immense differences in the climate of the two countries, nor of the fact that Indian mills are never crowded together. They do not go to make up an industrial city, but stand in wide open spaces of an area which would appear incredible at Dundee, at distances which would be unsuitable in Scotland; and lastly, instead of their labour-strength being drawn from the back slums or crowded streets of such a place as Dundee, each has gathered in its own grounds, as a rule, all the labour it requires in a special village. Here the mill provides residences, water supply, sanitary requirements; and endeavours, so far as possible, to keep its labour supply to itself, and to avoid competition with other mills. But the statistics of labour in Bengal will show, not only the ignorance of the Dundee Chamber, but the wholly uncalled-for character of its representations. Of a total of 162 factories in Bengal there were :—

Cotton mills	-	-	-	-	9
Jute mills	-	-	-	-	27
Jute presses	-	-	-	-	53
Leather works	-	-	-	-	15
Dockyards	-	-	-	-	9
Railway workshops	-	-	-	-	6
Printing presses	-	-	-	-	4
Miscellaneous	-	-	-	-	39

In these factories there were employed :—

Adults	-	{ Males	-	-	-	101,631
		Females	-	-	-	18,206
Children	-	{ Males	-	-	-	9,053
		Females	-	-	-	839

"The Dundee Chamber must have thought of the crowds of girls and women familiar to factory work in the United Kingdom. But in India it is rare indeed to find unmarried women and young persons working

in mills. This class of labourers have their male relatives with them, and the wages of all make up a common family fund. The picture of the evils naturally incident to the employment of women, drawn with such specious philanthropy, is absolutely and simply not only unknown but impossible in India.

“Inspection of Factories.

“The Committee pass on to the second part of the resolution—that relating to the inspection of factories. Here they need be but brief; the inspection of factories is complete and thorough, amply sufficient for all requirements of the Indian Factory Act, in itself an uncalled-for concession to British sentiment and jealousy. So far as the Committee are in a position to judge, the rules for inspection require relaxation rather than stringency, and operate in many cases to the inconvenience of mills and loss of the millworkers.

“Protective Claims of Dundee.

“But while the committee condemn the ignorance underlying the resolution of the Dundee Chamber, they do not overlook the spirit which dictated it. Put boldly, it is a claim that Parliament shall at any cost protect Dundee and similar manufacturing centres against India and the development of those industries which are beyond question indigenous to India. This claim involves political considerations of supreme importance. It will give rise to many grievances, to serious embarrassments, and to just and widespread discontent if India is to be met and checked at the outset of the renewal of her industrial career by such protective claims, so imperiously urged, and so very thinly disguised, as those of Dundee. Dundee may have to fear the competition of India, but her own competition with this country is an unnatural one. Is it possible for Parliament or any other authority to prevent capital from seizing on such advantages as the working up of a special and peculiar product by cheap and abundant labour at the point of production? The conditions are such that, while Dundee can maintain her superiority of machinery and skill of individual workers, she may retain the supply of special fabrics for certain markets, but she cannot hope to hold her own against such advantages as Bengal enjoys for turning the jute crop to account.

Dundee Competition.

“Dundee has not to consider the competition of India so much as the assertion of their independence by markets hitherto peculiarly her own. To show what this competition is it will be necessary to take a year of a full crop, say 1880-91. The figures will then be :—

	Cwts.
1874-75 total export of jute	5,493,957
1890-91 , , "	11,985,967

“Italy did not begin to take any jute till 1875-76—516 cwts.; nor Germany till 1879-80—31,503 cwts. In 1874-75, of a total export of 5,493,957 cwts., no less than 4,581,436 were to the United Kingdom. In 1890-91 the figures show that the use of jute was widespread, and

that the United Kingdom did little more than maintain its original position :—

1890-91.	Cwts.
Export of jute to United Kingdom	6,745,358
" " United States	2,715,728
" " Germany	1,432,872
" " Austria	316,788
" " Italy	304,704
" " France	295,205
" " Spain	36,731

"The committee of this Chamber take leave to draw the conclusion that Dundee would advance her interests more faithfully and truly by considering what the growth of non-British trade shown above means for her manufacturers and artisans, than by appealing to Parliament to hamper and restrict the employment of British capital in India by forcing on this country labour laws which have, so far, not advanced the prosperity or welfare of the British labourer—a policy this committee believe to be impracticable, and, which, if adopted, would give the jute trade, not to Dundee, but to Dundee's American and European rivals and competitors."

Col. Meade King, H.M. Superintending Inspector of Factories who visited the Bombay factories in 1882, remarks as follows :—

"A controversy which has been carried on during the past year between the Dundee and Bengal Chambers of Commerce, calls for a few remarks.

"The Dundee Chamber complains, not unnaturally, of the injustice which home textile industries suffer in consequence of the excessive hours of work of women, young persons, and children, permitted by the Indian Factory Act in Indian mills, and submits that 'Factories conducted by subjects of the Crown, equally under the control of Parliament, whether in India or at home, should be subject to similar conditions,' and particularly that the employment of women, young persons, and children, before 6 in the morning and after 7 in the evening, should be strictly prohibited.

"It is contended that the injustice is intensified by the fact that many (possibly a majority) of the Indian mills have been erected by our own countrymen, men who are subject to the British law, and who depend on the British Government for the ultimate security of their property. Similar complaints were made by Lancashire manufacturers, and especially by the Blackburn Chamber of Commerce, after the passing of the Indian Factory Act of 1891.

"The Bengal Chamber replies that there are 'no points of comparison' between the employment of women and young persons in the United Kingdom and in India, denies that the hours of work are excessive, and asserts that night work (on the shift system) is as yet in its infancy. Difference of climate, surroundings and isolation of Indian Mills, and superior physique of the mill operatives are all claimed as reasons for non-interference.

"Whilst accusing the Dundee Chamber of ignorance of the subject under discussion, the Bengal Chamber displays a notable instance of similar ignorance in claiming that Indian mills differ from British in

that all work is done *in the mills* and not taken to the *homes* to be done. It is difficult to see what part of textile factory work can be done at the homes of the workers.

"The Bengal Chamber is of opinion that the present inspection of factories is sufficient for all requirements of the Indian Factory Act (which is characterised as an uncalled-for concession to British sentiment and jealousy) and requires relaxation rather than stringency.

"Let us consider for a moment the chief points of difference between the Indian and English Factory Acts so far as hours of work are concerned :--

In Textile Factories in the United Kingdom.	In Textile Factories in India.
A woman may not be employed before 6 a.m. or after 7 p.m.	A woman may not be employed before 5 a.m. or after 8 p.m. (except in shifts or sets).
A woman may not be actually employed in any one day for more than 10 hours.	A woman may not be actually employed in any one day for more than 11 hours.
On Saturday a woman may not be actually employed for more than 6 hours.	On Saturday a woman may be employed as on other days.
Total hours of work per week, 56.	Total hours of work per week, 66.
All young persons (under 18 years of age) are restricted to the same hours of work as women.	All young persons (above 14 years of age) are treated as adults.
No child may be employed under the age of 11 years.	No child may be employed under the age of 9 years.
Children may not be employed except on the system either of employment in morning and afternoon sets, or of employment on alternate days only, and all children must attend school half-time.	Children may be employed during any 7 hours between 5 a.m. and 8 p.m., and are not compelled to attend school.
No woman, young person, or child may be employed during the night.	Women and young persons may be employed in the night in any factory in which a system of employment in shifts or sets has been approved by the local inspector.

"It must be extremely difficult, if not impossible, to enforce an accurate observance of the legal periods of employment of women and children in the Indian factories, owing to the wideness of the limits between which the actual hours of work may be taken. An inspector might find it necessary to sit in a mill all day to enable him to prove that a child had been employed more than 7 hours.

"The foregoing comparative table shows clearly that some of our home manufacturers, especially in Dundee and parts of Lancashire, are severely handicapped in their competition with manufacturers in India,

and it seems questionable whether the Bengal Chamber were quite justified in resenting the claims of the Dundee Chamber so emphatically as they have, on the ground of competition or jealousy. But apart from this, and even if we grant that the Dundee manufacturers were influenced, in great measure, by the loss which they felt they were sustaining, owing to the manifest inequality of the conditions of employment—and they would scarcely be human if they bore that loss without a murmur—yet credit must be given for a higher motive. Everyone knows that Factory Acts were introduced on grounds of *humanity* and not for the purpose of protecting one class of manufacturers against another. Is it not our duty to secure for the Indian operative all the benefit and wholesome conditions of employment which have been gradually produced by our own Factory legislation? It is idle to suppose there is no need for it, and no room for improvement in India. There is reason to believe, if we have regard to the well-being and physical improvement of our Indian fellow-subjects, that factory legislation of an earnest and thorough character is as much needed at the present moment in India as it was in Great Britain 50 years ago. And who will deny that it is better and easier to nip abuses in the bud than to spend years in trying to destroy them after they have taken root?

“A quotation or two from the pen of an inspector of factories, who was sent to India by request of the Government of Bombay, to inspect and report may be of some interest in this connection. He says: ‘If the women seen working in the mills are compared with those of the same race and class working outside the mills, a very marked difference in favour of the latter cannot fail to be observed.’

“Accounting for the absence of complaint by the workpeople themselves, who were said not to want any relaxation, he says: ‘Many of the factory operatives have experienced the horrors of famine, and being now in a position to earn more than ordinary wages, hesitate to run the risk of sacrificing a few annas for a gain of which they know not the value.’

“Further legislation, he thinks, ‘will tend to promote in succeeding generations that energy and vigour which are at present so conspicuous by their absence.’

“Again, in writing of the children, he says: ‘Nothing has impressed me more in the course of my inspection of the Bombay mills than the unhealthy, stunted, and puny appearance of a great number of the children whom I have seen at work, and I find that a similar impression has been made on the minds of professional men, who have had the same opportunities that I have had of seeing the children, and who are better judges of their condition.’

“Truly these extracts are taken from a report dated in 1882, but judging by the Indian Factories Act of 1891, the evils which provoked the adverse comments of the former date, have for the most part been allowed to continue without any efficient remedy.

LOCAL SANITARY AUTHORITIES.

The following reports have been received from some of H.M. Inspectors as to the action of the Local Authorities in their respective districts:—

Mr. Richmond, H.M. Inspector, Liverpool, reports:—

“Co-operation on the part of the local authorities, in carrying out the provisions of the Act of 1891 has made considerable progress during

the past year ; cards showing the number of hands that may be employed are to be found in workrooms throughout Liverpool, Bootle, St. Helen's, Widnes, Southport, Chester, Birkenhead, and Runcorn.

" Some of the smaller towns and the outlying districts have been slow to move, but the recent incorporation of Wavertree, West Derby, Toxteth Park, &c., within the boundaries of the city of Liverpool will remove the difficulty as far as the immediate neighbourhood of Liverpool is concerned. I have already supplied to the Medical Officer of Health for Liverpool a list of registered workshops in the newly incorporated districts. I append extract from the report of the Medical Officer of Health for Birkenhead, showing a statement of the work done by the local inspectors during 1894. It will be evident from this that the provisions of the Act, are being very efficiently carried out in Birkenhead. I also receive regular, and frequent notices of new workshops or removals from the other towns mentioned above.

" Extract from the annual report of the Medical Officer of Health, Birkenhead.

" " Factory and Workshop Acts, 1878 to 1891.

" " In connection with the carrying out of the provisions of these Acts, the following is a statement of the work done by the Inspectors during the year, viz :—

800 visits have been made to workshops.

96 workshops have been placed on the register during the year, making a total of 490 up to the end of 1894.

42 workshops have been closed.

26 workshops have bee transferred to more suitable premises.

347 nuisances in connection with workshops have been reported and abated.

80 notices have been served for the abatement of nuisances arising out of defective drainage, and 10 for inefficient ventilation.

50 notices to cleanse and limewash the workshops have been served and complied with.

In addition to the above, the occupiers of 45 workshops have limewashed their premises under inspection, but without waiting for the formal notice.

12 cases of overcrowding have been reported and stopped.

70 cases have been notified to H.M. Inspector of Factories as referred to in section 3, sub-section 3 of the Act.

" " Lists of out-workers have been carefully kept, and notices in the form prescribed by the Secretary of State, as given in my report for 1892 (pp. 57 and 58) have been served upon 45 employers.

" " Twenty-six additional outworkers had been placed on the register to the end of the year.

" Shop Hours Act, 1892.

" " In carrying out the provisions of this Act, the inspector has paid 800 visits to different shops, and the occupiers' names and addresses have been placed upon a register specially kept for the purpose, together with

the date of his visits. Printed notices in the following form have been served in every case :—

"THE SHOP HOURS ACT, 1892."

"Notice is hereby given, pursuant to section 4 of the above-mentioned Act, that no young person, (that is, a person under the age of 18 years), may lawfully be employed in this shop for a longer period than 74 hours, including meal times in any one week."

Mr. Jackson, H.M. Junior Inspector for the Liverpool District emarks :—

Local Authorities.—The Local Authorities in this division except in a few small country districts have been most energetic with regard to their duties in workshops."

Mr. J. H. Rogers, H.M. Inspector, Manchester, reports :—

"I beg to send you herewith a tabular statement from the annual report of the Superintendent of the Manchester Sanitary Department, from which you will see that the regulations of the Act of 1891 are being vigorously carried out in Manchester. The corporation have now six inspectors at work for the purposes of this Act and the Shop Hours Acts.

"I am glad to be able to report that other local authorities appear to be now taking some steps to carry out their duties under the Acts; notably Warrington, where a register of workshops has recently been set up. I have not received a single notice, however, of a new workshop under section 3 of the 1891 Act during the past year, from either the Medical Officer of Health for Warrington, or Northwich, though I have sent 85 such notices to them during this time. I think it would be better if the local authority itself, and not the medical officer, were responsible for notifying new workshops, as the latter, in many cases, has no direct supervision over the Inspectors whose duty it is to carry out the Acts.

"I find that during the year ending 30th November 1895, we notified the various local authorities in this district of 576 new workshops, and received 616 such notices from them, 591 of which were sent by the Manchester Corporation.

"I believe the regulations of part (2) of Section 7, 1891 Act, have been generally carried out in this district. I have repeatedly directed the attention of the local authorities to the matter, and as you will see from the superintendent's report which I send, the Manchester Corporation have served 12 notices to provide additional means of escape in case of fire during the year ending September 1895.

"Part one of the section referred to above has been neglected by the authorities in this district. I have directed their attention to five new factories coming within the sub-section, for which certificates of safety had not been granted; three of these places were in Manchester. I have frequently suggested that this requirement should be considered when the plans for new buildings are being examined, and I am now assured this will be done in future."

Mr. Prior, H.M. Inspector, Huddersfield, reports :—

"I have much pleasure in reporting that the sanitary inspection of workshops is now generally well performed in my district. My colleague

MANCHESTER.

work done by the Inspectors under the ACTS from the 20th September 1894 to 18th September 1895, inclusive.

In the whole of the 41 cases reported for infringements of the Shop Hours Act, the persons are now complying with the Act.

The 1,710 defects in factories and workshops,¹³² of the cases have been referred to the city surveyor to draw up plans for improved closet accommodation, in 14 of which cases necessary accommodation has been provided; 1,431 have been remedied, and 147 not remedied (*76 notices have been served, and 71 occupiers have promised to make good the ground floor with such means of escape in case of fire for the persons employed therein*).

In 9 of those cases referred to the city surveyor for report thereon, 19 bolt-houses closed and 98 not remedied (in 9 of those cases the medical officer of health reported the premises to be in unsanitary condition). Of the 407 defects in bolt-houses 454 have been remedied.

Of the 487 dwellings in unbroken houses, 420 have been remedied, 12 bathehouses closed, and 20 no longer used. In 9 of these cases the medical officer or health reporter was present, and 16 notices were issued for use on sanitary grounds, and the sub-committee referred them to the town clerk to take legal proceedings against the occupiers, three notices having been served, and 14 occupiers have promised to make good the defects).

and myself are frequently in communication with the local authorities on this subject; we work together very harmoniously, and any complaint or suggestion from us usually receives prompt attention.

"As I last year felt it my duty to comment rather severely on the neglect of the local sanitary authorities to enforce the erection of fire escapes in existing factories, I have now great pleasure in recording the fact that some action has at last been taken with the view of securing an observance of the law's requirements. Enquiries have been made into the best means of escape in use elsewhere, and I learn that some pressure has been brought to bear on a few leading millowners, in the hope of inducing them to set a good example to their neighbours. In the fulness of time possibly the compulsory powers which the law requires sanitary authorities to exercise may be put in force."

H.M. Inspector of Factories, Captain Smith, R.N., Sheffield, observes:—

"From my office we have, between October 1st, 1894, and October 1st, 1895, sent 49 notices of sanitary defects to the local authorities, most of these in my central town, Sheffield, where, owing to the courtesy of the medical officer of health, our representations have received careful and prompt attention.

"We have forwarded 265 notices of new workshops to local authorities, but the requirement contained in paragraph 3, section 3, of the Act of 1891, for sanitary authorities to give notice of new workshops to H.M. Inspectors, has in my district been a dead letter."

Mr. Knyvett, H.M. Inspector, Birmingham, reports:—

"While entirely agreeing with Mr. Crabtree that a great deal yet remains to be done before the manufacturing quarters of such a town as this can in any way be regarded as an 'Earthly Paradise,' I firmly believe that the local authorities in Birmingham are to an admirable extent improving these quarters, by removing rookeries and introducing improved systems of drainage and lighting. I think that results should rather be judged broadly than with regard to isolated exceptions, which without doubt may be found, as they probably always will be found, of unsanitary conditions.

"Such isolated cases, when coming under the notice of the factory inspector, will be more satisfactorily dealt with under the greatly improved regulations touching the notices to be sent between the inspector and the clerk to the local authority.

"Mr. Crabtree draws your attention to the healthy condition of the workshops at Redditch, the only manufacturing town away from Birmingham in the district, a matter to which he has been devoting considerable attention during the past year."

Major Roe, H.M. Inspector, Birmingham, remarks:—

"I have again to report that I have invariably met with hearty co-operation from all my local sanitary authorities."

Mr. Crabtree, H.M. Junior Inspector for Birmingham, remarks:—

"With my country parts I have little fault to find in regard to proper sanitation of workshops.

In Alcester the workshops are few in number, and those in existence employ few hands. The depression in the manual needle trade, which

has extended over several years, has practically shut up the Alcester workshops. The occupiers readily carry out my instructions *re* lime-washing, and give me no trouble in other matters.

"At Studley I also find occupiers willing to comply with my requirements, in fact, some of the shops are limewashed more frequently than is required by statute though few people work in them. Several of the Studley workshops have lately come within the category of 'domestic.'

"Last year I had to report a few of the Redditch workshops to the local authority. The medical officer took the matter in hand and that which was unsatisfactory has now been set right. I am pleased to say that some of the Redditch workrooms are the cleanest and healthiest that have come under my notice. It is the custom of most occupiers to limewash at least once every year. This year I have not found it necessary to complain to the local authorities at Redditch. The number of workshops in these parts is gradually diminishing owing to slackness of the manual needle and fish-hook trade, and the migration of the hands into the factories where the work is more uniform and the wages more regular.

"Of the Birmingham workshops I am not able to speak in such laudatory terms regarding their sanitary condition. Will you permit me to quote one or two instances? I visited one of these establishments some time ago, and found it occupied by a man whom I regarded as 'the occupier,' a woman, several fowls, a few pigeons and rabbits, all huddled together in one small room which had seen no limewash for over 14 months, and was being appropriated to the process of button making. Another workshop engaged in the same trade had its floor about two feet below that of an adjoining pig sty, so that the effluvia from the sty percolated through the walls of the workshop, and this where women work daily. In another case I investigated the sanitary conveniences—or rather inconveniences—attached to a tailor's workshop, and found in a miserably small pent-up back yard a loathsome midden closet, which was said to be used by 20 to 30 people of *both sexes*. Another workshop was partly occupied by a horse and its stall, the drain from which ran along the floor of the workroom, and this in a room where 'drinking cordials' were being made. And yet again, another room was occasionally devoted to rat-baiting and other such diversions. I found an improvised 'pit' in the centre of the room containing a full-sized victim of the fray. I could find other such specimens without difficulty; but these will, I think, show that though much has been done by the local authorities here to remedy the scandalous condition of the workshops as they once were, there is yet ample scope for activity."

Mr. Sedgwick, H.M. Inspector for the Walsall district, observes:—

"Though there has been considerable improvement in the methods by which the local authorities assist in carrying out the provisions of the Acts in workshops, there is much need of a more active desire to fully recognise the responsibilities rested in such authorities by the Act of 1891. But few notifications of protected persons being employed in workshops reach me. Workshops which are, or ought to be, known by the local sanitary officer, are frequently discovered by the Inspector of Factories. After the usual notices have been sent to the medical

officer of health, or the clerk to the Local Sanitary Authority, they are, in some cases, sent back with the request to be informed why such notices are sent to them, and under what Act power is given to them to act in cases of contravention. In Walsall, Bilston, West Bromwich, Smethwick, Tipton, Handsworth, &c., I believe active steps are being taken to ensure that the provisions of the Acts are being efficiently carried out by the occupiers of workshops. Cases where the water-closet accommodation has been found unsatisfactory, or inadequate, have been taken up and the evils existing remedied. In some of the smaller country towns it is more difficult to get the authorities to understand their duties with regard to occupiers of workshops, and under such circumstances progress is slow."

Mr. Hoare, H.M. Inspector, Norwich, remarks:—

"Local authorities do not carry out their duties as required by the Factory Acts; in very few places have I ever found them with anything like a systematic visiting of workshops; hardly any send any information to the Inspector of Factories.

"Probably this is in a great measure due to local officials having their hands full, or too many duties to perform, and having no spare time for this work; in many large towns the rates have grown so heavy that the ratepayers protest vigorously against any increase, and in some the medical officer of health declines to have his work increased without some increase to his salary; in other towns the inspector of nuisances works independently of the medical officer of health. What is far worse these sanitary officers dare not, in many cases, be too energetic where shops, workshops, and factories belong to or are occupied by men under whose authority they work and by whom they are appointed.

"The local authorities are becoming more prompt in dealing with complaints, but their views vary considerably as to the time in which an evil should be remedied and as to what is sufficient sanitary accommodation."

Captain Bevan, H.M. Inspector for the Southampton district, remarks:—

"I will only refer shortly to the reports of the local sanitary authorities. Mr. Wellesby Harris, M.R.C.S., Medical Officer of Health for Southampton, reports in his annual report for last year:—

"In compliance with the Factory and Workshops Act, 1891, my personal attention has been devoted to the sanitary conditions of most of the workrooms in the borough. The principal cases calling for improvement were overcrowding, insufficient ventilation, and want of cleanliness.

"Notices have been forwarded to the Government Inspector on matters requiring his intervention. The establishment of new workrooms has also been notified.

"It is our custom to obtain lists of out-workers from various firms in order that the sanitary conditions of their homes and surroundings may be inquired into, and to prevent clothing and other articles being made in the presence of infectious disease.

"The total number of workshops on our register amounts to 239 in which 898 persons are employed."

"I recently called on Dr. Harris; he showed the register of workshops kept, in which all particulars are entered. A printed form was in use

for reporting new workshops to H.M. Inspector, but owing to the want of a borough workshop inspector this has not been carried out lately, hence my visit. An inspector is now appointed, and will commence work at once.

"Dr. Mumby, Medical Officer for the borough of Portsmouth, says in his report for last year: 'The inspection of workshops has been continued and increased during the year. Inspector Benjamin, who has been specially appointed for this work, paid 4794 visits of inspection. A great improvement has taken place since the inspection of workshops (as far as sanitary conditions are concerned) has been performed by the inspector of the sanitary authority in place of Her Majesty's Inspector of Factories and Workshops. It would be better if the local authority were also empowered to inspect, and, where necessary, call upon the owners to improve the sanitary condition of the factories in the same manner as it can in workshops. Two hundred and sixty-two notices were sent to H.M. Inspector informing him of new occupation of workshops.'

"From what I gather from the various local authorities in the district more attention is now being paid by them to workshop inspection, though still in many cases there is still objection to a local inspector on the ground of expense, and without a local inspector little can be done. In several towns in other districts I have known the medical officer of health to act as workshop inspector, perhaps unwillingly.

Mr. Harston, H.M. Junior Inspector for the Southampton district, observes :—

"The authorities in this district still remain singularly lax in exercising the powers conferred upon them by the Act of 1891. With the exception of Portsmouth and Southampton no notifications are made of the employment of protected hands in workshops. From enquiries in a few of the towns I find that the nuisance inspector pays occasional visits to workrooms, and any complaints we send generally receive attention—that is, if the nuisance inspector thinks there is any ground for complaint. In the majority of cases no initial move is made by the sanitary authority, and in many of the rural districts, owing to there being no available water service, it often happens that the defect of which we have complained, though remedied for the time being, is quite as bad at our next visit to the workshop.

"Portsmouth is the only town I know in which any attention is paid to the Shop Hours Regulation Act.

"I only know of one case in which the local authority has taken any steps with regard to the provision of fire escapes, and its action was limited to sending out circulars calling the attention of occupiers to the requirements of the Act."

Mr. J. T. Birtwistle, H.M. Inspector, Blackburn, remarks :—

"I am pleased to be in a position to report considerable improvement during the year, in the administration of the Act of 1891 by the local authorities.

"In most districts, periodical inspections are made, and judging from some of the printed forms issued to the officer appointed, and which he is required to return with result of each visit, these inspections appear to be thorough.

"As to complaints forwarded to local authorities during the year, in one case only, and that slight, have I experienced delay in getting defects remedied."

Mr. Platt, H.M. Inspector, remarks, with reference to the Burnley district :—

Co-operation of local authorities.—I do not receive any notices of new workshops. However, I find that the local authorities now recognise that section 3 of the 1891 Act forms part of their duties."

Mr. J. H. Walmsley, H.M. Inspector for the Pottery district, observes :—

Local authorities.—In the County Borough of Hanley, Dr. Clare, medical officer of health, still continues his supervision of the workshops, and from time to time keeps me posted as to places visited.

"Recently I have seen several of the medical officers of health, and believe that in the new year they will take steps to comply with the requirements of the Factory Act of 1891."

Mr. R. Johnson, H.M. Inspector for Newcastle-on-Tyne district, reports :—

"I regret to report that no improvement is apparent in the conduct of sanitary authorities in their duties under the Factory Act.

"I have notified to them about 200 new workshops, but have received about one dozen notices, and those entirely from one town, Middlesbrough, who alone seem determined to do their duty thoroughly.

"One authority, on my sending to them a few complaints of insanitary workshops, replied not very politely that I must attend to them myself, though after some correspondence they have taken steps to attend to their duty."

Mr. J. Law, H.M. Inspector for Preston, observes :—

"Very little has been done by the local authorities in this district. With the exception of Kendal and Appleby, I have not received any notice of new workshops from the medical officer of health."

Mr. D. Walmsley, H.M. Inspector, Stockport, reports :—

"I regret to state that with the exception of Stockport and Crewe, no attention has apparently been paid by the local authorities to sanitary matters in workshops. In Crewe the medical officer and his inspectors have made a complete visitation of each workshop, each place has been tabulated, and full remarks entered against each particular workshop. I have been in constant communication with their medical officer, Dr. Jones, who appears to carry out his duties under the Factory Acts with the greatest efficiency and success.

"In an interview with the medical officer of health of a large industrial town, he very candidly informed me that his committee did not wish him or his officers to pay any attention to sanitary matters in workshops. Happily the new Act will give the workers more protection than hitherto.

"Dr. Porter the Medical Officer of Health for Stockport, has prepared a handbill containing the sanitary provisions of the Act which has been extensively circulated in his district, and the sanitary inspectors are going carefully through the workshops compiling a revised register.

"He has prepared an admirable register of which the following are the headings—

"COUNTY BOROUGH OF STOCKPORT.

"REGISTER of WORKSHOPS, including LAUNDRIES.

No.	Address and Name of Occupier.	Name and Address of Owner or Agent.	Trade.	No. of Rooms.	Cubic Capacity.
No. of Gas Jets or Gas Irons (3 Gas Jets count as one Person).	No. of Workers Employed.	No. of Workers Allowed.	Notice affixed.	Temperature and Means of Heating.	
Ordinary.	Overtime.	Ordinary at 250 c. ft.	Overtime at 400 c. ft.		

Means of Ventilation.			Closet Accommodation.		Water Supply.	Date and Hour of Inspection.	Remarks.
Opening Windows.	Open Chimney.	Other Means.	Nature and Condition.	For Sexes?			

"Dr. Herbert Jones, D.P.H., the Medical Officer of Health for Crewe, prepared an admirable *résumé* of the sanitary provisions of the Factory and Public Health Acts for the Health Committee of the Borough of Crewe, which will be found most useful.

Mr. Thomas Foley Cass, the Sanitary Inspector for Hull, has favoured Mr. Hine, H.M. Inspector of Factories, with the following remarks on what has been done by the Sanitary Authority in Hull :—

"*Factories.*—So far as we have had to deal with the sanitation of factories, *i.e.*, in respect to nuisances and other matters remediable by the Public Health Acts, these Acts having been carried out fairly well in factories, there has been but very little cause to complain. The matters we have had to deal with were principally improper or insufficient sanitary convenience, in some cases for the separate use of the sexes; but I have found it is not always wise to press too hardly for separate convenience for the sexes where the number of females employed is small, and where no considerable inconvenience is likely to arise, as it most probably would mean the discharge of the females by the employers rather than they should be put to the expense and trouble of erecting a new closet; however, we have secured some valuable alterations and additions both in respect to closet accommodation and drainage.

"*Fire Escapes.*—I have not yet been able to do much under this head as my committee are desirous of going very cautiously into this matter, and have decided to visit several factories themselves, after which, I trust the fire-escape clauses will be fully and thoroughly carried out. In a few instances we have received very ready compliance with our suggestions for the provision of permanent means of escape in case of fire, and these are being carried out.

"All plans of new factories and workshops are submitted to our department for examination in respect to means of escape in case of fire and other matters with which we have to deal.

"*Workshops.*—I am glad to report a very marked improvement in the general sanitary conditions of workshops in Hull. We have had much less difficulty with regard to cleansing than previously, and although there has been some degree of overcrowding in small tailors' and dressmakers' workshops, it is very gratifying to find there has been considerable, and I may say successful, effort on the part of employers to provide additional workroom accommodation for their hands.

"I should like to draw your attention to the gas stoves used by tailors for the purpose of heating their pressing irons. I have found these stoves very offensive, owing to the noxious fumes emitted by them, and the fact that they are usually placed on the floor in a corner of the workroom without the provision of any means of conveying away the fumes. I have found the following method of dealing with them very successful wherever it has been carried out:—a tinplate of black metal cover in the shape of a rectangular box with an arched top and open front, for the purpose of easy access in lifting the irons on and off the stove, is made to entirely cover the stove, and near the crown of the arched top a four-inch tube is let in, and this tube leads into an ordinary chimney flue, or up through the roof of the workshop as the case may be; with the result that, instead of the fumes being allowed to vitiate the air of the room, they are carried away immediately they are generated; moreover the draught caused by the heated gases ascending the flue or tube tends to draw from the room the products of respiration, &c., and thus assists ventilation.

"*Outworkers.*—As I stated to you in my remarks last year most of the outworkers employed in Hull are in the tailoring trade, this trade is almost entirely carried on on the outworkers' system; but few of the bespoke tailors have workshops of their own. As regards the outworkers' premises, I find them, speaking generally, kept in a fairly good sanitary condition, but it should be remembered that hitherto only the better class of outworkers have yet been reached, and probably the extension of the 27th section of the 1891 Act to all places from which work is given out in making wearing apparel may reveal worse conditions.

"The outworkers' system is not at all a commendable one, for although it may suit some of the older hands, it is far from satisfactory from a workman's point, and severely handicaps him in gaining a livelihood, work being very irregular, and the rate of pay differs very considerably with different employers; further, the workmen have to provide their own rooms, machines, sewings, gas, fire, &c., and are put to the trouble of going to and from the shops to fetch and take back their work; moreover, the system cannot be said to be satisfactory to the employer, for he loses the advantage of direct supervision of the work when in progress, and is put to considerable annoyance and inconvenience on this account.

"*Bakehouses.*—As you will perhaps remember, bakehouses only came under my supervision in November 1894. On going through them I found a large proportion very remiss in sanitary matters; cleansing was in many cases neglected, and in no less than 25 per cent. I found that, owing to the nature and the position of the sanitary conveniences, nightsoil had, at the time of collection, to be carried though the bakehouses.

"I am glad to say we have had this state of things altered by replacing the old-fashioned privies with new water-closets erected outside the buildings; and I have no doubt but that by strict supervision and periodical inspection much improvement may be gained in the sanitary conditions of bakehouses.

"Shop Hours' Acts.—After another year's experience in administering the Shop Hours Act, I am more fully convinced of its inefficiency to prevent injuriously long hours of employment of young persons in shops, and that any future legislation in this direction should limit a day's work, with fixed times at which employment might start and finish each day, and reasonable meal times should be allowed; and these should be stated in the shop hours' notice, which I think would be much better in a prescribed form than, as now, left to be any kind of notice people choose to put up; and, further, I think that this protection might with advantage be extended to all females, for I fear that those who continue in shop employment after attaining the age of 18 years suffer more, and are likely to suffer more, from their employment in close and stuffy, or, in many instances, the opposite extreme, cold and draughty shops, than young persons who rarely, if ever, are subjected to anything like the same exertions that competent hands are; of course, it might be argued that to interfere with adult female employment might handicap them against males, and this to a slight extent might hold good; but it should be pointed out that the peculiar adeptness of females at the trades in which they predominate, and the comparatively lower rate of pay, would sufficiently guarantee their retention.

"I find that the usual hours of employment in shops are 11 or 12 hours per day, with one or two long days per week of 13 to 16 hours, and one short day of five to nine hours; I also find that both male and female hands who have ceased to be young persons, are frequently employed even longer hours than these.

"Many shopkeepers have expressed themselves to be in favour of compulsory early closing of shops, but whether such a proposal would be practicable or not remains a question unanswered, and most probably it would be deemed too great an interference with the civil rights of the people to ever become popular."

Mr. Lewis, H.M. Inspector for Wales, remarks:—

"Local Authorities.—In the chief centres of Wales and Monmouthshire, the local sanitary authorities have done much, and are still doing their utmost, in a very systematic way, to assist the Factory Department in carrying out the provisions of the Factory Act, 1891, relating to sanitation. The medical officers of health and the sanitary inspectors doing duty in the principal towns of North, Mid, and South Wales appear to be fully alive to the importance of co-operating with me and my staff in the important matter of the sanitary condition of workshops, and of getting those wherein protected "hands" are employed entered upon our official register.

"I regret I cannot report in the same strain respecting local authorities in large urban areas and rural manufacturing districts, and I cannot help thinking that the Local Government Board might do much towards ensuring more general co-operation were they, by some means, to urge all local authorities to fulfil their obligation, under the Factory and Workshop Acts."

Mr. Le Davies the Chief Sanitary Inspector for Swansea, has given Mr. Lewis the following report showing active co-operation :—

Inspection of Workshops in the Borough of Swansea from June 1st to December 31st, 1895.

Number on Register	-	-	-	294
Number of visits	-	-	-	550

Classified as follows :—

Tailors	-	-	-	17
Dressmakers	-	-	-	65
Bootmakers	-	-	-	44
Bakers	-	-	-	74
Joiners	-	-	-	22
Milliners	-	-	-	11
Plumbers	-	-	-	5
Hosiers	-	-	-	7
Smiths	-	-	-	10
Mineral Works	-	-	-	5
Wool Spinners	-	-	-	5
Bottlers	-	-	-	3
Painters	-	-	-	4
Printers	-	-	-	3
Saddlers	-	-	-	2
Other Trades	-	-	-	17
				294

Sanitary defects found :—

Overcrowded Workshops	-	-	9
Premises requiring limewashing	-	-	35
Defective lighting and ventilation	-	-	6
Insufficient w.c. accommodation	-	-	8
Defective drainage	-	-	29
Dilapidated buildings	-	-	14
Cases reported to H.M. Inspector of Factories	-	-	7

Mr. Hilditch, H.M. Junior Inspector for North Wales, reports :—

"With the exception of the towns of Wrexham, Flint, Rhyl, Llandudno, and Carnarvon, the inspection of workshops and the co-operation of the local authorities may be regarded as *nil*. There are no visits paid to workshops in any of the other places unless on complaint."

"The authorities at Rhyl, Mold, Hawarden, and Llangefni sent in a list of workshops in their respective towns at the commencement of this year. Many of these were places having men only employed."

"During the influenza epidemic in the months of February and March last, Dr. Fraser, M.D., B.Sc., medical officer of health for the combined sanitary district of Carnarvon, had posters exhibited in all the towns and villages within his jurisdiction. Amongst other matters of advice to the public regarding precautions to be taken during the epidemic, was the following :—

"The warming and ventilation of workshops and workrooms should receive special attention during the epidemic."

Mr. Edwards, H.M. Junior Inspector for South Wales, remarks :—

“ I have to report the same indifference on the part of the local authorities as I noted in my last year’s report. With the exception of Cardiff and three or four other districts in this section of the Welsh district the only administration by the local authorities can be summed up in the attendance to complaints forwarded to them.

“ Despite the four years’ trial the inspection of workshops by the sanitary authorities is beyond doubt practically a failure and the section a dead letter, consequently I venture to suggest that it would be better if the clauses in question were repealed and workshops placed once more under the old régime.

“ The present state of affairs is far from being satisfactory, as according to the evidence of Dr. J. T. Arlidge—‘ Defects in ventilation and in working space surpass in their disastrous effects upon the health of the employed all other injurious conditions taken together. In not a few instances defective ventilation and working space represent almost the whole of the conditions recognisable as prejudicial to health, especially so in many simple handicrafts and purely sedentary employments.’

“ Much has been and is being done to alleviate the conditions of employment, especially so in what is known as ‘ Dangerous Trades,’ where the injurious actions are more apparent and quicker in their result, but not more certain than the injurious associations of confined space and defective ventilation. Yet the supervision and rectification of the largest causes of diseases in our factory system is relegated to authorities who neglect to do the work, and until the clauses are repealed or the Local Government Board insist upon better supervision, better results cannot be expected.

“ During the past year the Cardiff sanitary inspectors visited 729 workshops with the result that 58 nuisances were abated. They were as follows :—

Water-closets repaired, &c.	-	-	19
Drains attended to	-	-	14
Ventilation improved	-	-	2
Limewashing done	-	-	16
Structural alterations	-	-	5
Overcrowding	-	-	1
Workshops closed	-	-	1
			58

“ The Shop Hours Act inspector also visited 948 shops, 840 of which employed young persons, the result of the inspections being that four prosecutions ensued.”

H.M. Inspector, Mr. Calder, Aberdeen, remarks :—

“ I have endeavoured to confer with the representative officials of urban and county sanitary authorities, and find that no systematic inspection of workshops is undertaken. In all cases, however, complaints from our Department are attended to.

“ The neglect to supervise in any way the sanitary condition of workshops is usually explained by the officials concerned to arise from the increasing demands upon the staff and the rates of other departments of public health, and the reluctance of committees to increase the burden of taxation.”

Mr. Bellhouse, H.M. Inspector for the Dublin district, reports:—

"I regret to say that I cannot report any additional assistance from the local authorities. If I except Dublin and Cork, I do not think there is any one town where the local authority does a single thing to carry out the provisions of the Act. If I send a complaint it is certainly attended to, but beyond this the whole question of the sanitary condition of workshops is ignored. And even when I come to consider Dublin itself, I am surprised that so little is done. Until quite recently they have been satisfied here to investigate and remedy complaints made by the factory inspector; there was no systematic inspection and no register of workshops kept. I am glad to say though that there is a prospect of the matter being taken up properly at an early date. I have had an application for a list of the factories in Dublin where more than 40 hands are employed, and the question of fire-escapes is to be carefully gone into. I have had a long interview with Sir Charles Cameron, the chief Medical Officer of Health for Dublin, and have gone very carefully into all the duties of local authorities with him, and he has promised me to see to the arrangement of more regular inspection of workshops in future, and I am supplying him with a list of workshops in Dublin for that purpose. I trust therefore that next year I shall be able to report a more satisfactory state of things, and I can assure you that I shall do all in my power to induce the local authorities in other towns to carry out similar arrangements. I should add that in Mullingar, and in Portadown I have received promises that the workshops should be regularly inspected by the sanitary inspectors, but I have not had an opportunity of finding out to what extent this has been done."

"In most places I have found the local authority utterly ignorant of what their duties are in respect to the Factory Acts."

Mr. Snape, H.M. Inspector, Belfast, remarks:—

"I am pleased to have to report that the local authority of Belfast co-operate with me as regards sanitation, and any complaints forwarded by me to the sanitary authorities in the country districts receive attention, but I regret to have to state that, to the best of my belief, nothing as yet has been done towards altering structural defects as regards cases of fire, with reference to buildings erected before 1891."

PROTECTION OF CHILDREN ACTS.

*Prevention of Cruelty to and Protection of Children Act, 1889,
and Prevention of Cruelty to Children Act, 1894.*

Return of licenses granted under section 3 of the Prevention of Cruelty to and Protection of Children Act, 1889, and section 3 of the Prevention of Cruelty to Children Act, 1894, forwarded to the Factory Department during the 14 months from 1st November 1894 to 31st December 1895:—

Licences granted to theatres, &c. - - -	267
Licences granted for school entertainments, &c., continuing more than one evening - - -	18
Licences granted for school entertainments, &c., for only one evening - - - - -	12
Total - - - - -	297

EDUCATION AND EMPLOYMENT OF CHILDREN.

I have received the following reports from H.M. Inspectors:—

Mr. Sedgwick observes:—

“The want of agreement between the Education Acts and Factory Acts has caused considerable trouble in a certain part of this district, and I have no doubt many other districts as well as Walsall. A child who has passed Standard Five, or who is 13 years of age without having so passed, nor made the prescribed number of attendances to be enabled to work full time in a factory or workshop, is now awkwardly placed. Half-time employment is not to be had, and for a time the child has the run of the streets. Should employment be sought full time, or what is so within the meaning of the Act, is offered and accepted, parents and employers risk detection; both are of the poorest class, and the necessities of the people creates the temptation to contravene the Act. So long as the boy, who has left school under the conditions before-mentioned, runs the streets, getting into lazy and sometimes semi-criminal habits, neither the School Board nor the Factory Acts will interfere with him, but should the parents perceive the mischief being done, and try to avoid worse evils arising by sending the boy to try and get an honest living by work, then both School Board and the Factory Acts come down on them at once. Something seems wrong altogether here.”

Mr Crabtree reports:—

“*Half-timers.*—In Birmingham these still stand at *nil*. In Redditch they are again on the decrease; several factories have abolished the system, and some ‘take on’ only at 14, irrespective of school qualifications, while others refuse to admit until Standard Six is attained.

“Some of the schools in my country parts claim a fee from half-timers, while full-timers have free places. At this I do not wonder, as the presence of half-timers in any school greatly increases the labour and responsibility in that department without the possibility of a proportionate return. Moreover, the terrible evils and deprivations which have in some places been anticipated from the abolition of half-time labour have not, here in the Midlands, been evidenced in fact.

“Having myself entered the factory at eight years of age, and tugged away as a half-timer for five years, I venture no theoretical suppositions but prefer to keep to experience and observation, and feel convinced, sir, that the health and development of the child is materially assisted by his having the chances of mental and physical education extended to his teens.

“Parents around here are believing this more and more, and are acting upon it. They do not appear to be one whit worse off for their action.

“And when the children do begin in their work they take it up even more vigorously than they would at an earlier age, with the result that they stick to their occupation and make progress.”

Mr. Jackson remarks:—

“*Half-timers.*—With reference to this vexed question I am in favour of its total abolition, and instead of it of allowing a child of 12 years, who has obtained the necessary certificate of standard or school attendance, to be employed as a young person. It seems absurd to allow a child of 12, exempt from school attendance, to go to work (not for 60

hours per week, but for a legal 74) as errand boy for the ‘butcher, baker, or candlestickmaker,’ where he not only is employed excessive hours, without any legal half-holiday, but is often compelled to carry heavy weights for long distances, work which, in my opinion, is far more injurious than the ordinary work in a factory or workshop.”

Mr. Hoare observes:—

“In some of the smaller workshops children are employed full time; for this the school authorities are in some measure to blame, as they grant children exemptions from school without telling them that such exemptions do not entitle them to work full time in a factory or workshop.”

Mr. Harston remarks:—

“Only a very small number of half-timers are employed in the Southampton district. Periodical examinations, held specially for the granting of labour certificates, are, I think, unknown here, and children of 13 years, who might qualify at such examinations, are therefore frequently debarred from employment altogether until they attain the age of 14. As a rule employers will only take on such hands as are entitled to full-time labour, and unless a child at 13 has made the proper number of attendances at school he has very little chance (owing to the slight facilities afforded for securing a labour certificate) of getting employment until he is qualified by age. Where there is no School Board it is difficult to obtain definite information as to the time and place at which the earliest examination will be held; and as, under the new Code, examinations will not always be held annually, in future the difficulty seems likely to be increased rather than lessened. Fourteen seems quite early enough for full-time labour, and if this were made the minimum age for such employment with the present, or perhaps a higher school attendance qualification, the arrangement would, I think, be much more satisfactory all round. A child who is mentally dull would have a better chance of adding to his little store of learning; while the smart youngster would have a fair opportunity of acquiring the best education that a public elementary school can offer. The objection is, of course, that the standard qualification is an incentive to a boy to be industrious in his studies; but if the goal aimed at is simply the acquirement of a qualification by virtue of which he may leave school, its value does not appear very great.”

MISCELLANEOUS OBSERVATIONS.

Ventilation.

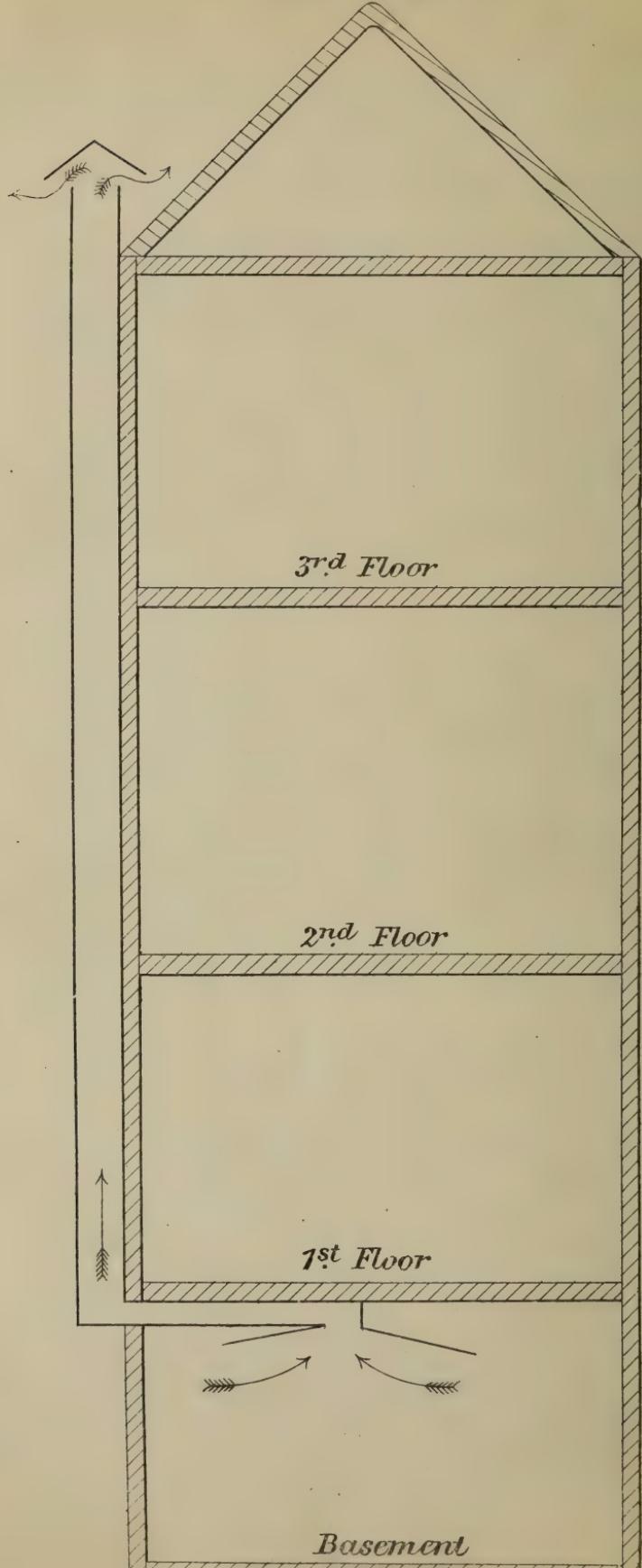
I have received the following reports from some of H.M. Inspectors with respect to ventilation:—

Captain Smith, R.N., observes:—

“Ventilation must always be a difficult question. The highest authorities differ as to the best methods, and what is a good system in one room or building will fail in another, but there is one point apparently too self-evident to require explanation, but which I find the least understood—that whereas ventilation is good, draught is bad.

“How often can I anticipate the ready reply to suggested ventilation, ‘Oh, they can open the windows!’ forgetting that in winter—often in summer—for persons (often delicate women) occupied in sedentary

VENTILATOR AT L & N.W.RY BRASS FOUNDRY,
STOCKPORT.



Basement

occupations an open window means draught, chill, and all the attendant risks. How often am I told, and truly, they will stop up the ventilators! But why? Because they are badly constructed; the main principle, to admit fresh and emit foul air in a diffused form and without draught, has never been attempted."

Mr. Harston remarks:—

"The question of ventilation is not always easy of solution; and one not unfrequently finds, after having secured at much trouble improved atmospheric conditions, that the very people for whose benefit the change has been effected has rendered it either partially useless or altogether inoperative. Only a short time ago, at a large glove manufactory in this district, I pointed out that the ventilation was not all that could be desired. The occupiers readily agreed to do all they could to remedy the defect. A firm of well-known ventilating engineers was engaged to do the work, and a considerable sum of money was expended in providing what is certainly an excellent system of ventilation. Some time after the work had been completed I paid another visit to the place, and in the principal workroom found every air inlet choked with rags. A large number of workers were employed in the room, and as the numerous gas jets were alight the air was in a very foul and unhealthy condition. The manager informed me that he had remonstrated over and over again with the hands on the folly of obstructing the air tubes, but they seemed prejudiced against a flow of fresh air into the room. At another mill, where the occupiers have, at my suggestion, gone to much expense in providing fans for the removal of dust, I found those in the weaving shed at a standstill. On inquiring the reason, the manager informed me that the men had come in a body to him and requested that the fans should be stopped in the shed referred to. 'We have had to comply with their wishes,' said the manager, 'because we have only just had one strike of 14 weeks' duration, and do not want another yet awhile.' He added that it took a little time to overcome their prejudice, but he would be able to do it by degrees. The men stated to me that they objected to the fans because they caused strong draughts when the doors were opened, and they much preferred the dust to the breezy currents produced. There is no doubt in some cases good reason for such objections; but the masters can scarcely be blamed after making the required provision."

Mr. D. Walmsley reports:—

"Marked improvement has been made in ventilation and sanitary matters during the past few years in the hatting trade, which was formerly notoriously bad; the chief offenders now, I find, are the workers themselves. Very often I find the inlets closed and the ventilators at the top covered with paper or nailed up. So prevalent had this become that I sought the aid of the operatives' general secretary, who offered to call a meeting of the women and censure them for their folly. Now, if they know that H.M. Inspector is near a rush is made to have all ventilators open.

"A most useful ventilator for a brass foundry in a basement has been fixed by the London and North-Western Railway Company at Stockport. As the sulphurous fumes were at times objectionable, and as no motive power was available at that part for a fan, the chief engineer had an admirable ventilating shaft fixed outside, and opened out by means of two 'bonnets' at the top of the ceiling in the casting shop. The ventilator is excellent in its results, and could very easily be applied to this or other classes of workshops with the same results."

Boilers.

Mr. D. Walmsley, H.M. Inspector, reports as follows :—

“ No power is yet given to H.M. Inspectors or any other persons to examine boilers, and cause them to be kept in a safe condition ; this subject is brought before my notice again in consequence of a fatal boiler explosion in this district. The facts are as follows :—

“ A man commences business as a provender dealer, he requires motive power for his chopping machine. He buys a boiler and steam engine of about four horse power. The total cost of these are only 10*l.*, including their erection, &c. The boiler had not been worked for 10 years, and was not tested before working again. It was fitted with the old-fashioned ‘ wheel and float ’ water gauge, had two small safety valves, and was made to blow off at 15 lbs. pressure. As this pressure was not sufficient it was weighted to 25 lbs., and one of the safety valves made up. Neither the owner or his employees knew anything about boilers, but were led or instructed by non-practical men. The boiler subsequently ‘ tilted ’ at one end, leaving a portion of the firebox bare, through not having any injector or force pump to keep the boiler filled whilst being worked. Consequently a terrific explosion occurred, bringing down the building, killing one young person, and injuring two men. The utmost incompetence was exhibited in this case, and yet the man was not amenable to any law until the boiler exploded.

“ May I repeat a case which still exists. It is a small horizontal boiler. The boiler in question has no water-feed, water-gauge, or steam-pressure gauge. It is filled from the man-hole, which is then screwed down, and from the time the fire is lighted there is no indication of the water, or the pressure of steam, and the safety-valve is regulated by weights on a long lever.

“ Although I have pointed out this danger to the occupier, he is content to let the boiler remain as it is, ‘ it having been in that condition for tens of years and been safe.’

“ I submit that power is wanted to prevent this apparent danger from existing any longer.”

Creameries in Ireland.

Mr. G. Bellhouse, H.M. Inspector, remarks :—

“ In the South of Ireland I have now a very large number of creameries, and the number is still rapidly increasing. I need not remind you that only a few years ago Irish butter was looked on as the very best made, and fetched a higher price in the market than any other butter. Unfortunately foreign competition stepped in, and Ireland had to give way to Denmark and other foreign markets. The consequence was the butter trade was in great danger of dying out altogether. The Irish Agricultural Organisation Society, however, took the matter up, and enquired into the reason of this loss of trade, and how the foreigners could produce a better and more reliable article than the Irish farmers. The reason was at once obvious. Abroad the principle of co-operation was in force. The farmers all joined together, and sent their milk to one creamery, and in consequence they produced a much more reliable article than was possible when each man was working for himself. The colour was always the same, the amount of salt in all the butter was the

same, and the quality was always to be depended on. It was determined then to try to introduce a similar system into Ireland, and with what success the following statistics will show :—

In 1889 there was 1 society with 50 members.

„ 1890	1	50	„
„ 1891	17	850	„
„ 1892	25	1,050	„
„ 1893	30	1,250	„
„ 1894	33	1,650	„
„ 1895	67	3,800	„

(March 31st.)

and to day this number has been still further increased to 80 societies. There can be no doubt, I think, that this society is doing wonderful work, and doing much to alleviate the distress amongst the farmers in this country."

CONCLUDING REMARKS.

The arrangements you have been pleased to make for offices in every district, with a clerk for each inspector, will be of great assistance in meeting the increased demand on the Department. Correspondence is continually increasing, and in addition to the statistical returns which have to be prepared, the following registers are kept at each office:—

REGISTER of CORRESPONDENCE.

Number.	Date.	Subject.	Remarks.
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REGISTER of INFORMATIONS.

Name.	Address.	Date of Laying Information.	Date of Hearing.	Where to be heard.	Amount of Cost.
When Paid.	To whom Paid.	When received back.	Penalties.	Costs.	Offence.
					Remarks.

REGISTER of REFERENCES to SANITARY AUTHORITIES.

No.	From whom received.	Date of Receipt.	Workshops referred to.	Subject of Reference.	To whom Referred.	Date when Referred.	Result.
			Name.				

REGISTER OF REFERENCES from SANITARY AUTHORITIES.

No.	From whom received.	Date of Receipt.	Workshops referred to.		Subject of Reference.	To which Inspector Referred.	Date when sent to Inspector.	Date when Reported on.	Result
			Name.	Address.					

REGISTER of COMPLAINTS.

Person and Place complained of.	Nature of Complaint.	Date of Receipt.	Date of Enquiry.	Result of Enquiry with Result of Prosecution (if any).	Remarks.

It is of great importance that the offices should be permanent, so that if the individual inspector be changed all may know that the inspector for the district can be found there, and thus no one may be able to plead ignorance as to where notices should be sent.

The appointment of additional inspectors, which you have sanctioned in Bradford, Newcastle-on-Tyne, Liverpool, Belfast, the division of the South London District with the appointment of an additional inspector, and peripatetic inspectors in London, Glasgow, and Birmingham, to be available wherever H.M. Superintending Inspectors consider their services most required; the addition of inspectors to assist Mr. Birtwistle in the administration of the particular clauses, and the addition of an inspector to the Female Inspectors' Department, will be of great assistance in meeting the additional work necessitated by the Act of 1895.

The tables of statistics published in the Appendices to the present Report are of a more elaborate nature than those contained in previous Reports. The following summaries are published this year for the first time:—

Appendices 3 B, 3 C, 3 D, and 3 E.—Classifications of convictions on the basis of the nature of the offence. The particulars given are arranged respectively according to the districts of H.M. Inspectors (*vide 3 B and C*) and the industries carried on in the factories and workshops where the offences were committed (*vide 3 D and E*).

Appendices 5 B and 5 C.—Classifications of accidents reported during the year on the basis of the age and sex of the person injured (*vide 5 B*), and the cause of the accident (*vide 5 C*). The particulars given are arranged according to the industries carried on in the factories and workshops where the accidents occurred.

Appendix 6.—A table of notices required to be served on H.M. Inspectors, or exhibited in the works, of the sections of the Factory Acts to which they refer, and the numbers received during the year.

Appendices 7 and 7 A.—Lists of non-textile factories and of workshops, respectively, in which overtime may be worked, and the number of notices of overtime received from the occupiers of such factories and workshops.

Appendix 8.—A summary of complaints respecting workshops made to the local authorities by H.M. Inspectors of Factories.

The legislation of the last few years has undoubtedly increased the usefulness of the Department, more especially the regulations

with reference to dangerous trades, the special rules in connection with which, to prove successful, required more hearty support from those for whose benefit they have been framed.

Permit me to express the hope that by the united action of the Local Authorities, Employers, Employees, and H.M. Inspectors, factory legislation may increasingly promote the health, happiness, and prosperity of those for whose special welfare such legislation is designed.

I have, &c.,

The Right Hon.

R. E. SPRAGUE ORAM.

Sir. M. W. Ridley, Bart., M.P.,

&c. &c. &c.

The Secretary of State for the
Home Department.
